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THE AUTOMOBILE

Protecting the Automobile Public with Insurance

An Explanation of the Class of Automobile Insurance Which is Written by the Casualty Insurance Companies

How the Car Owner Can Secure Himself Against Monetary Losses Imposed by Law for Striking Pedestrians and for Property Damage—Collision Insurance Covers the Machine Itself

Part II.

FIRE and marine insurance companies cannot write liability automobile insurance. It is written exclusively by the casualty companies. The latter can also write theft, collision and property damage insurance, but not fire. Thus these two classes of companies by reason of their charter restrictions overlap each other's fields in the matter of collision, theft and property damage underwriting. This was explained last week.

By liability insurance is meant protection against loss on account of personal injuries to others, caused by reason of the maintenance, ownership or use of automobiles. Or, in the terms of an automobile liability policy, the insurance company indemnifies the insured . . . against loss by reason of the liability imposed by law upon the insured for damages on account of bodily injuries, including death, at any time resulting therefrom, accidentally suffered by any person or persons by reason of the maintenance or use of any of the automobiles enumerated and described in the body of the policy, provided such bodily injuries are suffered within the period therein described. The policy also covers such bodily injuries if caused by means of loading or unloading goods carried on automobiles used for transportation and delivery of material or merchandise and so specified in the declarations of the policy.

All automobile liability insurance policies afford the insured practically the same protection, although there is no standard form and the wording varies somewhat. When boiled down however, the substance of them all is the same. A consideration, then, of any one representative liability policy will serve to throw light on them all.

There is usually an insuring clause worded similarly to that already given. These policies are written to cover anywhere within the United States and Canada, and the conditions which invalidate them are:

When the automobile or automobiles insured are operated by any person in violation of law as to age, or in any event, under the age of 16 years.
When used in any race or speed contest.
When used for any purposes other than those set down in the declarations or warranties of the policy.

It will be evident to the insured, therefore, that he must know exactly what those declarations and warranties are. The first two stipulations are good ones from the standpoint of the public as well as the insurance company. Knowing that he cannot get insurance protection if he injures persons while racing or allowing a child to drive his car, the careless owner is prone to have greater regard for the welfare of the public, even if he is not stirred by humanitarian motives.

The conditions which appear in the body of the liability insurance policy of one company are:

A. Upon the occurrence of an accident covered by this Policy the Assured shall give immediate written notice thereof, with the fullest in-

Fire, Theft and Transportation

Last week's issue of The Automobile in addition to containing a number of considerations in regard to insurance in general had a delineation of the standard form of fire, theft and transportation policy as issued by the fire and marine insurance companies under supervision of the Automobile Underwriters' Conference, an unincorporated body which held its first meeting on June 14, 1911, in New York City.

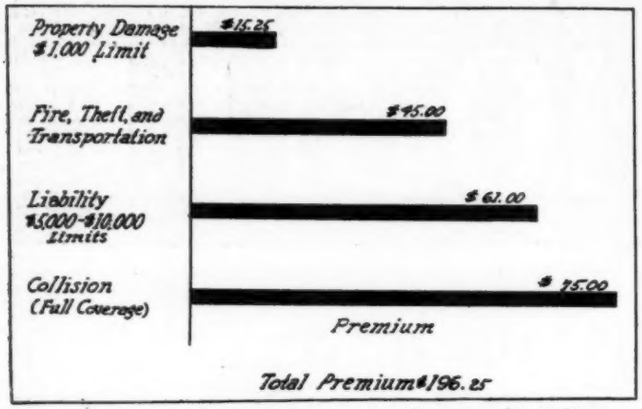


Fig. 1—Diagram showing relative cost of various protections on a Cadillac touring car; 1912 model; price $1,800; 32 insurable horsepower, when insured in either Boston, Philadelphia or Pittsburgh

formation obtainable at the time, to the Company or its duly authorized agent. If a claim is made on account of such accident the Assured shall give like notice thereof with full particulars. The Assured shall at all times render to the Company all co-operation and assistance in his power.

B. If suit is brought against the Assured to enforce a claim for damages covered by this Policy he shall immediately forward to the Company every summons or other process as soon as the same shall have been served on him, and the Company will, at its own cost, defend such suit in the name and on behalf of the Assured.

C. The Assured, whenever requested by the Company, shall aid in effecting settlements, securing information and evidence, the attendance of witnesses and in prosecuting appeals, but the Assured shall not voluntarily assume any liability or interfere in any negotiation for settlement, or in any legal proceeding, or incur any expense, or settle any claim, except at his own cost, without the written consent of the Company previously given, except that the Assured may provide at the Company's expense such immediate surgical relief as is imperative at the time of the accident.

D. No action shall lie against the Company to recover for any loss and / or expense under this Policy unless it shall be brought by the Assured for loss and / or expense actually sustained and paid in money by him after actual trial of the issue, nor unless such action is brought within two years after payment of such loss and / or expense.

E. In case of payment of loss and / or expense under this Policy the Company shall be subrogated, to the amount of such payment, to the Assured's rights of recovery against others for such loss and / or expense, and the Assured shall execute all papers required and shall co-operate with the Company to secure such rights.

F. If the Assured carry a policy of another insurer, against any loss and / or expense covered by this Policy, the Assured shall not recover from the Company a larger proportion of the entire loss and / or expense than the amount hereby insured bears to the total amount of valid and collectible insurance applicable thereto.

G. No assignment of interest under this Policy shall be valid unless the written consent of the Company is endorsed hereon, signed by its president, a vice-president, secretary or assistant secretary.

H. The premium is based upon the number and character of the automobiles and the uses to which same are to be put as described in the warranties hereof.

I. The Company shall be permitted at all reasonable times to inspect any automobile covered by this Policy.

J. This Policy may be cancelled at any time by either of the parties hereto upon written notice to the other party stating when thereafter cancellation shall be effective; the date of cancellation shall then be the end of the policy period, and if cancelled by the Company the earned premium shall be computed and adjusted upon a pro rata basis. If, however, such cancellation is at the request of the Assured, the earned premium shall be calculated at short rates in accordance with the table printed hereon. Notice of cancellation mailed to the address of the Assured stated in the warranties hereof shall be a sufficient notice, and the check of the Company similarly mailed a sufficient tender of any unearned premium.

K. No condition or provision of this Policy shall be waived or altered except by written endorsement attached hereto and signed by the president, a vice-president, secretary or assistant secretary of the Company; nor shall notice to any agent, nor shall knowledge possessed by any agent or by any other person, be held to effect a waiver or change in any part of this contract. Upon the acceptance of this Policy the Assured agrees that its terms embody all agreements then existing between himself and the Company or any of its agents relating to the insurance described herein. The personal pronoun herein used to refer to the Assured shall apply regardless of number and gender.

L. No person shall be deemed an agent of the Company unless such person is authorized in writing as such agent by the president, a vice-president, secretary or assistant secretary of the Company.

M. The Company's liability for loss on account of an accident resulting in bodily injuries and / or death to one person is limited to.....Dollars ($.....); and, subject to the same limit for each person, the Company's total liability for loss on account of any one accident resulting in bodily injuries and / or death to more than one person is limited to.....Dollars ($.....). The Company will however, as provided in Conditions B and C hereof, pay the expense of litigation in addition to the sum herein limited and will also pay all costs taxed against the Assured in any legal proceeding defended by the Company, and interest accruing after entry of judgment upon such part thereof as shall not be in excess of the limits of the Company's liability herein expressed.

Then follows the warranties as to the name of the insured, his address, occupation, the number of automobiles owned, the number of chauffeurs employed, the location where the automobiles are principally operated, the place where they are usually kept, a description of the cars covered by the policy and a statement as to the uses to which each is put.

By the terms of the policy it is seen that the company will defend at its own expense any suit which is brought against the insured so long as such suit covers claims within the scope of the policy (Condition B). The insured is required to co-operate with the company, however (Condition C).

As to the insured's right to recovery, Condition D states that no action shall be brought against the insurance company to recover for any loss under the policy . . . unless it is brought within 2 years after the payment of this loss by the insured. This time limit varies with different policies. In one case it is restricted to within 90 days after the final judgment against the insured has been satisfied. The owner of a policy covering liability of this kind should make it a point to study and familiarize himself with the provisions made regarding these particulars in his contract.

Companies Protect Themselves

Condition E as to subrogation of rights ostensibly prevents the double payment of damages. Let us assume that an automobilist accidentally strikes a man in the street. He is badly bruised and is taken to a hospital. The insurance company, tentatively, pays the hospital bill of the injured man. Later, this man sues the insured driver of the car for damages on account of personal injuries. In the decision which is rendered on the case it is shown that the man was struck through no fault of the insured. The insurance company and not the insured through this subrogation clause then stands to be the recipient of the refunded hospital expenses, which the injured man must pay himself, since it has been shown that the accident was not through the fault of the car owner whom the insurance company is protecting by reason of his policy. This is the only one of several ways in which the subrogation clause works out.

Condition F, which refers to concurrent insurance, prevents the insured from collecting more than the loss actually sustained by reason of having more than one policy covering the same risks. That is, supposing the car owner carries two liability automobile policies with two companies, each for $1,000, total liability insurance $2,000. He is required to pay damages by reason of personal injury to another person to the amount of $1,000. Condition F provides that since the company has only one-half of the total insurance carried it must pay only one-half of the $1,000 claim. It is evident therefore that there is no advantage to the insured in carrying more than one policy covering the same risk, unless he does not care to trust exclusively to the solvency and integrity of one insurance company.

The cancellation feature of the policy, Condition J, should be understood: The policy may be cancelled by either the insuring company or the insured. In either case written notice of such cancellation and the date when it is to become effective must be forwarded to the other party of the contract. If the company cancels the policy, the adjustment or payment for the time it was actually in force is made on a pro rata basis; that is, the premium which the policy has earned or which the insured must pay is in exact proportion to the amount of time it has run on the basis of its total period when issued and the total premium. If it has run 6 months, one-half the premium is charged, and so on. If the insured cancels the policy, the premium to be paid is greater than a strictly pro rata one would be, and the following table of "short rate" cancellation is effective:

CANCELLATION—TABLE OF SHORT RATES, SHOWING PER CENT. OF PREMIUMS EARNED

Months since issue of Policy....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Policy issued for 1 year.....	20	30	40	50	60	70	75	80	85	90	95	100																								
Policy issued for 3 years.....	10	15	20	23	27	30	33	37	40	43	47	50	53	57	60	63	67	70	72	73	75	77	78	80	82	83	85	87	88	90	92	93	95	97	98	100

This table shows the per cent. of the total premium which must be paid in the event of premature termination for a 1-year and a 3-year policy. Supposing that the policy is for 1 year and that the insured cancels it after 4 months. The table indicates that 50 per cent. of the yearly premium must be paid. On the pro rata basis only 33 1-3 per cent. of the premium should be paid.

The other conditions of the policy are self-explanatory and need no further comment.

There are two certificates or clauses which may be had in connection with the liability policy. These are property damage and collision insurance certificates.

Property damage insurance covers claims for damages on account of injury to, or destruction of, property of all kinds belonging to other persons. Property of others which is carried by the car is excepted.

Property and Collision Damage

The insuring clause, conditions, exclusions of the property damage form as generally adopted by the casualty companies follows:

In consideration of the premium, the insurance company agrees to indemnify the Assured named and described in warranties against loss by reason of the liability imposed by law upon the assured for damages on account of damage to or destruction of property of every description (except property of the Assured or in charge of the Assured or any of his employees, or carried in or upon the automobiles covered hereby and except loss or damage caused by fire) resulting from an accident due to the ownership, maintenance and / or use of any of the automobiles enumerated and described in and covered by the Policy to which this certificate is attached, providing such damage or destruction occurs during the period for which this certificate is issued and is in force.

This certificate does not cover loss arising or resulting from accidents occurring while the automobiles insured are being operated by any person under sixteen (16) years of age; while being operated in any race or speed test; or while being maintained or used beyond the limits of the United States of America and Canada.

The Company's liability for loss under this certificate on account of any one accident is limited to the actual intrinsic value of the property damaged or destroyed at the time of its damage or destruction or the cost of its suitable repair or replacement but in no event shall exceed..... .....Dollars ($.....), which limit shall apply to each of the automobiles described in said Policy. The Company will, however, defend in the name and on behalf of the Assured any suits which may at any time be brought against him on account of such damage, including suits alleging such damage and demanding compensation therefore, although such suits, allegations or demands are wholly groundless, false or fraudulent. All costs of such defense and all expenses incurred by the Company shall be paid by the Company in addition to the limit of its liability as herein expressed.

All terms, conditions and agreements of the Policy to which this certificate is attached, and all statements and warranties forming part of said Policy—in so far as the same do not conflict with the specific undertakings of this certificate—shall be considered as incorporated in and made a part hereof, and shall apply as if actually written or printed herein.

Cancellation of the Policy to which this certificate is attached shall operate as a cancellation of this certificate.

It will be observed that the same restrictions as to age, territory and operation are imposed as in the body of the policy, and that all conditions and agreements of the policy itself are held to apply to the property damage clause.

The standard form of automobile collision damage certificate appears either as a $25 deductible average or a full coverage form and it has the same restrictions as the property damage form. If, however, any conditions in the policy itself conflict with any of the specific regulations or undertakings of the certificates, such conflicting conditions are annulled for the particular certificate in question by its own clauses.

The substance of the $25 deductible average collision damage certificate is given below:

In consideration of the premium, the insurance company agrees to indemnify the Assured described in said warranties against loss or damage to any of the automobiles herein described, including its operating equipment, while attached thereto, if sustained within the period covered by this certificate and if caused solely by collision with another object, either moving or stationary (excluding, however, all loss or damage by fire from any cause whatsoever, all loss or damage caused by striking any portion of the roadbed, or by striking street or steam railway rails or ties, and all loss or damage caused by the upset of the insured automobile unless such upset is a direct result of such a collision as is covered hereby), subject to the following limitations:

1. The Company's liability for such loss or damage is limited to the actual intrinsic value of the property damaged or destroyed at the time of its damage or destruction or the cost of its suitable repair or replacement. In either event the amount thereof and / or the nature and extent of the damage requiring repair or replacement is to be determined as hereinafter provided.

2. Loss or damage to tires shall not be covered unless the total loss or damage—including such tires—resulting from one collision shall exceed the sum of two hundred dollars ($200.00). Each claim hereunder shall be adjusted separately, and from the amount of each claim when determined the sum of twenty-five dollars ($25.00) shall be deducted and the Company shall be liable for loss or damage in excess of that amount only.

This certificate does not cover loss or damage arising or resulting from accidents occurring while the automobiles insured are being operated by any person in violation of law as to age, or in any event, under the age of sixteen (16) years; while being operated in any race or speed test; or while being maintained or used beyond the limits of the United States of America and Canada.

In the event of such loss or damage the amount thereof or the nature and extent of the damage requiring repair or replacement may be determined between the parties hereto, if possible, otherwise, by two appraisers, one to be chosen by the Assured and one by the Company. The two appraisers so chosen if they are not able to agree may select a third and the award in writing of any two of the appraisers shall determine the amount of such loss or the nature and extent of the damage requiring repair or replacement. The Company and the Assured shall pay the appraiser respectively selected by them and shall bear equally the other expenses of the appraisers and of the third appraiser if one is selected.

The Company may accomplish such repair or replacement so determined by such means as it may elect, or at the option of the Company pay in money the amount of the loss as fixed by the appraisers. The Company shall have reasonable time and opportunity to examine any damaged automobile or its equipment covered hereby before repairs are undertaken or physical evidence of the damage removed, but the Assured shall not be prejudiced hereunder by any act on his part or in his behalf, undertaken for the protection or salvage of the damaged automobile or its equipment.

All terms, conditions and agreements of the Policy to which this certificate is attached, and all statements and warranties forming part of said Policy—insofar as the same do not conflict with the specific undertakings of this certificate—shall be considered as incorporated in and made a part hereof, and shall apply as if actually written or printed herein.

It will be noticed that the property damage certificate covers damage to the property of others, while the collision certificate relates to damage sustained by the insured's car or its equipment.

The liability insurance policy protects for $5,000 in the event of an accident which causes the death or injury of one person, and $10,000 when the accident is responsible for the death or injury of more than one person. It may be taken out to give greater protection than this, but the rates which will be given here apply to the more generally used policy having these limits.

The liability premium is based on the horsepower of the automobile insured. The horsepower used is called the insurable horsepower as distinguished from the advertised horsepower. Insurable horsepower is taken according to the S. A. E. rating, which is the old A. L. A. M. formula,

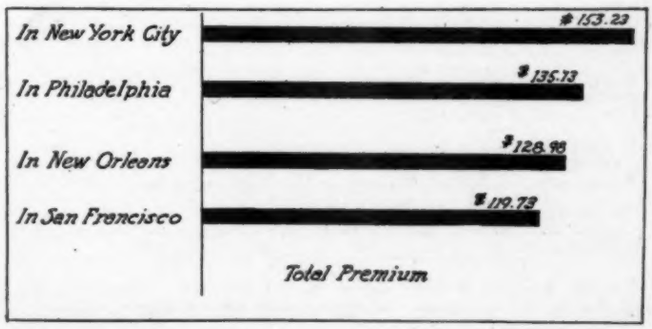
$$\text{Horsepower} = \frac{D^2N}{2.5},$$

In which D = cylinder diameter in inches.
N = number of cylinders.
2.5 = a constant.

Property damage insurance rates are also based on insurable horsepower. It cannot be written for sums less than $1,000. If the limit is to be increased, 10 per cent. of the liability premium for $5,000-$10,000 limits is charged for each additional $1,000 of property damage insurance. The minimum annual premium for $1,000 property damage insurance is $7.50 on electric automobiles and motorcycles and $10 on all other motor vehicles, which include gasoline and steam.

In arriving at the rates to be charged for liability and property damage insurance three district schedules must be used:

Schedule 1. Certain districts in and around New York, St. Louis, Chicago and Kansas City.
Schedule 2. Certain districts in and around Boston, Philadelphia, Providence and Pittsburgh.
Schedule 3. All other territory in the United States.



Relative cost of insuring a Ford T touring car, 1912 model, in four cities. Protection on a list price of $690 for one year. The insurance includes fire, etc., full-coverage collision, $1,000 property damage and $5,000-$10,000 liability

There are three rate schedules corresponding with these territorial divisions. The first schedule has the highest rates, while No. 3 is the lowest. The rate schedules follow:

RATE SCHEDULE NO. 1.

Horsepower	Liability premium	Property damage premium $1,000 limit	Horsepower	Liability premium	Property damage premium $1,000 limit
16	$35.00	$10.00	38	$84.00	$21.00
17	39.00	10.00	39	85.00	21.25
18	43.00	10.75	40	86.00	21.50
19	47.00	11.75	41	87.00	21.75
20	51.00	12.75	42	88.00	22.00
21	54.00	13.50	43	89.00	22.25
22	57.00	14.25	44	90.00	22.50
23	60.00	15.00	45	91.00	22.75
24	63.00	15.75	46	92.00	23.00
25	66.00	16.50	47	93.00	23.25
26	68.00	17.00	48	94.00	23.50
27	70.00	17.50	49	95.00	23.75
28	72.00	18.00	50	96.00	24.00
29	74.00	18.50	51	97.00	24.25
30	76.00	19.00	52	98.00	24.50
31	77.00	19.25	53	99.00	24.75
32	78.00	19.50	54	100.00	25.00
33	79.00	19.75	55	101.00	25.25
34	80.00	20.00	56	102.00	25.50
35	81.00	20.25	57	103.00	25.75
36	82.00	20.50	58	104.00	26.00
37	83.00	20.75	59	105.00	26.25
60 H. P. and above				106.00	26.50
Electrics and motorcycles				25.00	7.50

RATE SCHEDULE NO. 2

16	$25.00	$10.00	38	$67.00	$16.75
17	28.00	10.00	39	68.00	17.00
18	31.00	10.00	40	69.00	17.25
19	34.00	10.00	41	70.00	17.50
20	37.00	10.00	42	71.00	17.75
21	40.00	10.00	43	72.00	18.00
22	43.00	10.75	44	73.00	18.25
23	45.00	11.25	45	74.00	18.50
24	47.00	11.75	46	75.00	18.75
25	49.00	12.25	47	76.00	19.00
26	51.00	12.75	48	77.00	19.25
27	53.00	13.25	49	78.00	19.50
28	55.00	13.75	50	79.00	19.75
29	57.00	14.25	51	80.00	20.00
30	59.00	14.75	52	81.00	20.25
31	60.00	15.00	53	82.00	20.50
32	61.00	15.25	54	83.00	20.75
33	62.00	15.50	55	84.00	21.00
34	63.00	15.75	56	85.00	21.25
35	64.00	16.00	57	86.00	21.50
36	65.00	16.25	58	87.00	21.75
37	66.00	16.50	59	88.00	22.00
60 H. P. and above				89.00	22.25
Electrics and motorcycles				20.00	7.50

RATE SCHEDULE NO. 3

16	$25.00	$10.00	38	$61.00	$15.25
17	27.00	10.00	39	62.00	15.50
18	29.00	10.00	40	63.00	15.75
19	31.00	10.00	41	64.00	16.00
20	33.00	10.00	42	65.00	16.25
21	35.00	10.00	43	66.00	16.50
22	37.00	10.00	44	67.00	16.75
23	39.00	10.00	45	68.00	17.00
24	41.00	10.25	46	69.00	17.25
25	43.00	10.75	47	70.00	17.50
26	45.00	11.25	48	71.00	17.75
27	47.00	11.75	49	72.00	18.00
28	49.00	12.25	50	73.00	18.25
29	51.00	12.75	51	74.00	18.50
30	53.00	13.25	52	75.00	18.75
31	54.00	13.50	53	76.00	19.00
32	55.00	13.75	54	77.00	19.25
33	56.00	14.00	55	78.00	19.50
34	57.00	14.25	56	79.00	19.75
35	58.00	14.50	57	80.00	20.00
36	59.00	14.75	58	81.00	20.25
37	60.00	15.00	59	82.00	20.50
60 H. P. and above				83.00	20.75
Electrics and motorcycles				20.00	7.50

With this data at hand, it is only necessary to know the S. A. E. horsepower rating of the car and its operative locality in order to fix the rate.

For example: Suppose it is desired to determine the premium on a 30-horsepower car operated in Pittsburgh for a $5,000-$10,000 liability policy and a $1,000 property damage policy. Refer to the territorial schedules and No. 2 will be found to apply to Pittsburgh. Now pass to rate schedule No. 2. Opposite 30 horsepower the rates are $59 on the liability and $14.75 on the property damage policy; total, $73.75.

Premiums on liability policies where the limits are greater than $5,000 for injury or death of one person and $10,000 for more than one are according to the following rates:

5,000	to	10,000	100 per cent.	10,000	to	50,000	175 per cent.
5,000	to	15,000	112 "	15,000	to	15,000	132 "
5,000	to	20,000	125 "	15,000	to	20,000	145 "
5,000	to	25,000	135 "	15,000	to	25,000	155 "
5,000	to	30,000	140 "	15,000	to	30,000	160 "
5,000	to	35,000	145 "	15,000	to	35,000	165 "
5,000	to	40,000	150 "	15,000	to	40,000	170 "
5,000	to	45,000	155 "	15,000	to	45,000	175 "
5,000	to	50,000	160 "	15,000	to	50,000	180 "
7,500	to	10,000	112 "	20,000	to	20,000	155 "
7,500	to	15,000	125 "	20,000	to	25,000	165 "
7,500	to	20,000	137 "	20,000	to	30,000	170 "
7,500	to	25,000	147 "	20,000	to	35,000	175 "
7,500	to	30,000	152 "	20,000	to	40,000	180 "
7,500	to	35,000	157 "	20,000	to	45,000	185 "
7,500	to	40,000	162 "	20,000	to	50,000	190 "
7,500	to	45,000	167 "	25,000	to	50,000	195 "
7,500	to	50,000	172 "	30,000	to	60,000	200 "
10,000	to	10,000	115 "	35,000	to	70,000	205 "
10,000	to	15,000	127 "	40,000	to	80,000	210 "
10,000	to	20,000	140 "	45,000	to	90,000	215 "
10,000	to	25,000	150 "	50,000	to	100,000	220 "
10,000	to	30,000	155 "	60,000	to	120,000	225 "
10,000	to	35,000	160 "	60,000	to	130,000	230 "
10,000	to	40,000	165 "	70,000	to	140,000	235 "
10,000	to	45,000	170 "	75,000	to	150,000	240 "

The application of this table is as follows: Suppose it is desired to carry a liability policy which has limits of $15,000 and $25,000. The premium would then be 155 per cent. of the premium for $5,000 to $10,000 limits. In the instance cited of the Pittsburgh 30-horsepower car where the liability premium was $59 at base rates, that for these increased limits would be 1.55 times $59, or $91.45.

In certain specified localities where the risks are low the insurance companies give a special reduction of 25 per cent. from liability rate schedule No. 3. In Colorado, for instance, this 25 per cent. reduction is allowed except within 20 miles of the city limits of Denver, Pueblo and Colorado Springs. The full list of the localities which are subject to this 25 per cent. liability reduction cannot be published here for lack of space.

This 25 per cent. reduction does not affect the property damage and collision rates.

Insurance for a Damaged Car

Premiums for collision insurance, that is, where the damage is done to the owner's car, are based on the value of the car. The rates are found by means of a book of cars which is issued by the insurance companies to cover every make of car of every model from 1905 to the present. No car which has been manufactured and sold under any trade name has been left out of this rating book, a sample page from which is given:

Name.	Model.	Adv. HP.	Ins. HP.	Premium Class 1	2	3
Pathfinder	Car	40	27	D	D	
Peerless	33	40	40	M	N	O
Peerless	35	38	38	L	M	P
Peerless	36	48	49	P	Q	S
Peerless	37	60	60	R	R	T
Peerless		24	24			N
Packard	E. F. G. H.	25	26	A	A	
Pierce Arrow		36	38	L	M	P
Pierce Arrow		48	49	P	P	S
Pierce Arrow		66	60	R	R	T
Pilot	40	40	32	D	D	
Pope-Hartford	27	50	36	I	I	M
Pope-Hartford	28 (6 cyl.)	60	45	M	M	P
Pratt	Forty	40	32	D	E	
Premier	M (6 cyl.)	60	49	K	K	
Premier	M	40	32	H	I	
Pullman	4-30	30	26	C	C	
Pullman	4-40	40	32	E	E	
Pullman	6-60	60	49	H	H	
Rambler		38	32	C	C	
Rambler	Country Club, Valkyrie	50	40	F	F	
Rambler,	Moraine	50	40	G	G	
Rambler	Greyhound, Metropolitan	50	40	H	H	
Rayfield		35	29	G	G	
R. C. H.		25	17	A		
Reading	40	40	40	C	D	
Regal	N	20-25	22	A		A
Regal	L-LF-LE-LO	30	27	A	A	D
Regal	S-SF	40	32	C	C	
Regal	H	35	29	B	B	
Renault (F)	(6 cyl.)	40-50	37	R	S	U
Renault		35-45	42	P	R	S
Renault	Amer. Spec.	25-35	30	P	Q	S
Renault		20-30	24	P	Q	R
Renault		18-24	25	O	P	R
Renault		14-20	20	L	M	P
Renault		12-16	16	J	K	M
Renault		10-12	12	H	I	K
Renault		9-12	8	F	G	I
Renault		8-10	7	C		F

It contains the name and model of the car, the advertised and insurable horsepower and the premium classes.

These premium classes are as follows:

Class 1. Open cars carrying not more than 3 persons, such as runabouts or runabouts with single rumble.

Class 2. Open cars carrying more than 3 persons, such as touring roadster, demi-tonneau, pony-tonneau, toy-tonneau or runabout with double rumble.

Class 3. Closed cars of all types, such as coupes, broughams, limousines or landaulets

In addition to this data, it is necessary to have the following table to arrive at collision rates:

"$25 Deductible Average"				"Full Coverage"			
A	$28.00	N	$90.00	A	$63.00	N	$125.00
B	32.00	O	95.00	B	67.00	O	130.00
C	36.00	P	100.00	C	71.00	P	135.00
D	40.00	Q	110.00	D	75.00	Q	145.00
E	45.00	R	120.00	E	80.00	R	155.00
F	50.00	S	130.00	F	85.00	S	165.00
G	55.00	T	140.00	G	90.00	T	175.00
H	60.00	U	150.00	H	95.00	U	185.00
I	65.00	V	160.00	I	100.00	V	195.00
J	70.00	W	160.00	J	105.00	W	205.00
K	75.00	X	180.00	K	110.00	X	215.00
L	80.00	Y	190.00	L	115.00	Y	225.00
M	85.00	Z	200.00	M	120.00	Z	235.00

Having this data we can now proceed to determine the rate on any car enumerated on the sample page. Suppose the rate on a 1912 Pierce-Arrow touring car having an advertised horsepower of 36 is desired. Being a touring car it comes under Class 2. Referring to the sample page, the rate-letter for this car is found to be M (premium class, column 2). Now turning to the rate table the premium is seen to be $85 for a collision certificate having a $25 deductible average clause (see certificate form on page 1013 and $120 for a collision clause which gives full coverage.

Rates Depend on Many Conditions

It is seen that rate-fixing for automobiles is very much involved and depends on a large number of conditions. A few examples of total insurance premiums covering all risks except personal accident may serve to show the automobilist what it costs to operate a car with perfect pecuniary safety. The examples follow:

Cadillac Touring Car; price $1,800; 32 H.P., S. A. E. In Minneapolis, Minn.:

Fire, theft and transportation	$45.00
Collision (Full coverage clause)	75.00
Property damage	13.75
Liability	55.00
	$188.75

National Touring Car; price $3,000; 40 H.P., S. A. E. In Rochester, N. Y.:

Fire, etc	$75.00
Collision (Full coverage)	95.00
Property damage	15.75
Liability	63.00
	$248.75

Ford Model T, touring car; price $690; 22.5 H.P., S. A. E. In Boston:

Fire, etc.	$18.98
Collision	63.00
Property damage	10.75
Liability	43.00
	$135.73

Same car in St. Louis:

Fire, etc.	$18.98
Collision	63.00
Property damage	14.25
Liability	57.00
	$153.23

Reo The Fifth, Runabout; price $1,000; 26 H.P., S. A. E. In New York City:

Fire, etc.	$27.50
Collision	63.00
Property damage	17.00
Liability	68.00
	$175.50

Packard Thirty, touring car; price $4,200; 40 H.P., S. A. E. In Philadelphia:

Fire	$94.50
Collision	125.00
Property damage	17.25
Liability	69.00
	$305.75

Same Packard car. In New York City or St. Louis:

Fire	$94.50
Collision	125.00
Property damage	21.50
Liability	86.00
	$327.00

NOTE.—These rates are all based on liability policies of $5,000 to $10,000 limits; collision clauses having full coverage ($25 deductible collision clauses are uniformly $35 cheaper); property damage clauses having a limit of $1,000.

Cars which are not "this year" or "next year" models take higher rates for fire, theft and transportation protection, than those given, according to their ages.

It will be noticed that the premiums vary largely for different localities, on the same car, as, for instance, the example of the Packard in the cities of Philadelphia and New York or St. Louis. This difference of about $22 between the rates in these cities comes in the property damage and liability part.

The collision protection is not affected by the locality, which seems to be rather difficult to understand. Since property damage and liability risks are considered to depend largely on the locality, then, to be consistent, collision or the damage to the car itself should depend on the locality also. There would seem to be as much chance in congested districts for damage to the car as for damage to the property of others, or liability of striking others.

But such is the present status of automobile insurance. Take another example—that of the Ford touring car in the cities of Boston and St. Louis. It costs just $18 more to get full protection in St. Louis than it does in the Hub. And the latter with its narrow, crooked streets, which would almost seem to invite accidents!

There is no denying the fact that automobile insurance is a great risk, when looked at from the standpoint of the insurance company. The car in its course through the congested streets of the big city, and even on the country roads for that matter, is open to many accidents. A turn in the road, a fallen tree, a crowded street corner, all have their possibilties for accident. When it is considered that there are millions of such conditions arising daily and that 80 per cent. of the American automobilists have some sort of insurance protection, it becomes apparent that the burden is not all on the shoulders of the automobile public.

If rates are high, the insurance companies are not wholly to blame. The charges which they exact for the various forms of protection are figured from long experience with such risks and from statistics extending over long periods, and they have calculated to make a reasonable profit. The best way to reduce these rates, therefore, is for the insured public to be more careful and co-operate with the insurance companies. This is the root of the whole matter. The public by reason of its performance with automobiles from year to year has fixed the rates itself, primarily and indirectly, and it is this same public which will be responsible for any reduction in the existing premiums in the future. To do this, the number of accidents through carelessness and recklessness must be reduced.

This is not only true of automobile insurance, but of insurance in general. The recent *Titanic* disaster is an evidence of the part the public and conditions play in premium costs. When the great ship was unauthentically reported to be sinking the Lloyds rate was raised 50 per cent. for insurance on her, and was reduced to 25 per cent. when later false dispatches stated that she would be towed to port.

Fire insurance rates in certain localities are much higher than

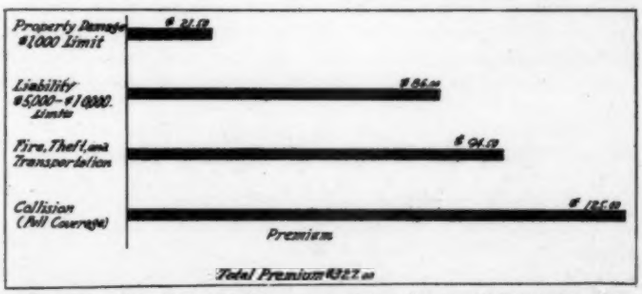


Diagram showing premium on various classes of insurance protection on a 1912 Parkard 30 touring car; price, $4,200; 40 insurable horsepower. Insured in either New York, St. Louis, Chicago or Kansas City

in others, due to the large number of conflagrations in those sections. It costs more to get fire protection in San Francisco than in other cities.

Perhaps if the rates were based on the records of the drivers, the number of careless automobilists would be greatly decreased, for then it would cost a great deal of money to drive a car without regard for consequences. By such a method the careful driver would be rewarded for his thought for the welfare of the public at large.

Each insurance company has a special form of application blank the question on which the insured must answer before the policy will be issued. This blank when filled out contains all the warranties which the policy will contain. The point to be emphasized here is that more than one insurance policy has been annulled through the car owner's false statements as to facts in regard to the car's age, the uses for which it is intended and so on. Tell the truth absolutely, for on it depends the validity of the policy. If the car is older than three years, and therefore uninsurable, be frank about it, for the insurance company will find it out sooner or later, and if later you will have paid several premiums which you cannot recover.

And, above everything else, know what the conditions, limitations and requirements of your policy are. Otherwise you may or you may not recover in case of loss. That will be a matter of luck. Eliminate the element of chance.

[NOTE—THE AUTOMOBILE will be pleased to answer any questions as to automobile insurance, its rates, conditions or any of its phases which readers may wish to ask.—ED.]

Receiver for Hoosier Agency

INDIANAPOLIS, IND., April 29—On a petition filed by the Wabash Realty & Loan Company the Marion Superior Court has appointed the Central Trust Company receiver for the Indiana Automobile Company, one of the largest and oldest motor car and accessories dealers in the city. Crawford W. Fairbanks, who is president of the plaintiff company, is one of the principal stockholders in the motor car concern. The suit was based on a note given by the motor car company in the sum of $10,000 to the realty company, and which was indorsed by Mr. Fairbanks. A part of the note has been paid and judgment is asked for $8,000. Mr. Fairbanks was the only witness examined. He said that the motor car company is not insolvent, but is in danger of insolvency and that the business has fallen off on account of bad weather and a late spring. The company's assets are said to exceed the liabilities, but there is a lack of ready cash to carry on the business at this time. The company has the agency for the Penn, Reo and Chalmers.

Court Orders Sale of Ewing Plant

FINDLAY, OHIO, April 30—Judge Killits, in the United States Supreme Court, at Toledo, has ordered the Ewing-American Motor Company's plant in this city sold at public auction within the next month. John M. Barr is receiver.

Because of the company's inability to get more money the concern was thrown into the hands of a receiver last September. Findlay capital will buy the plant and open it at once. The concern, organized by L. W. Ewing, of Cleveland, employed 200 men.

Sues for Return of Agency Rights

LINCOLN, NEB., April 29—John Westover, of Lincoln, has applied to the district court for an injunction against the Cartercar Nebraska Company and the Capitol Car Company. He says that in September, 1910, he was given the agency for the Cartercar for Lancaster county, and after he built up a trade, the Nebraska company the following year turned over the contract for the county to the Capitol Car Company. He wants to secure again the agency for the Cartercar for the county.

Legal News of the Week

Dorian Rim Company Goes Into Bankruptcy—Cody vs. Warren Thrown Out for Lack of Jurisdiction

Sale of Ewing Plant Ordered by Court—Indianapolis Agency in Receiver's Hands

PRESSURE brought upon the Dorian Remountable Rim Company by creditors whose claims were trifling in themselves caused bankruptcy proceedings to be brought against the company in the United States District Court on Thursday last week. Joseph M. Conklin was named receiver under bonds of $40,000 and a temporary order was issued by the court allowing the receiver to continue the business for 30 days.

The troubles of the Dorian company date back to the failure of the Rosett string of banks last winter, Max Rosett, president of the involved concerns, being the chief financial backer of the rim company. At the time of the Rosett failure the rim company was indebted to Rosett for about $185,000 and owed approximately $15,000 to other creditors, according to the statement of Irving Ernst, attorney for the Dorian concern.

It was apparent after the failure of the banks that some other means of financing the operations of the company would have to be found and the property was offered at private sale as a going concern.

This offer failed to bring out any reasonable bids, the largest tender being only $55,000 for the assets. As there was on the books of the company an item of $40,000 of bills receivable, the offer of $55,000 was refused.

In the meantime one or two of the small creditors filed suits on their claims and in order to preserve the property and administer it in bankruptcy in ordinary course, the Mott Wheel Company, New York Drop Forgings Company and several others petitioned to have the company adjudged bankrupt.

The corporation was formed 3 years ago with a capitalization of $250,000 and has occupied a prominent position in the field of rim manufacture, the product being standard equipment on several well-known makes of cars. According to the local officers, business is and has been excellent.

The assets have been roughly estimated at $100,000, including the $40,000 on bills receivable. Despite the apparent disparity between the assets and liabilities, officers of the company state that the prospects are far from hopeless.

Court Says It Lacks Jurisdiction

The suit of the Cody Motors Company against the Warren Motor Car Company in the United States District Court has been halted by an order issued by Judge Noyes which holds that the service was defective and the court had no jurisdiction.

The case was commenced by the Cody company in the New York Supreme Court at the time of the Madison Square Garden show in January and was transferred to the federal court on motion of the defense. No bill of complaint was filed in the state court and the proceedings before Judge Noyes were confined solely to discussion of the jurisdiction.

The Cody company had engaged in some dispute with the Warren company concerning a contract of agency, one side claiming that such a contract had been made and the other that it had not, within the purview of the statute.

In the opinion filed by Judge Noyes the court holds that the Warren Motor Car Company never had any legal existence in New York and never did any substantial amount of business within the state and, as it was a foreign corporation and unregistered in New York, it was not subject to service.

Oppose the Oldfield Bill

Manufacturers, Attorneys and Others Cite Reasons Why Patent Measure Should Not Become Law

Grabowsky Creditors Formulate Working Plan — Company in Good Condition

WASHINGTON, D. C., April 29—Not less than fifty representatives of large manufacturing concerns throughout the country appeared before the House Committee on Patents to discuss the Oldfield bill. A number of representatives of the Registered Association of Patent Attorneys were present in opposition to the measure. Arguments made were to the general effect that the proposed law would be unconstitutional; that it makes such radical changes as to practically destroy the patent law; that it would have the effect of giving the commissioner of patents and his assistants practically a life tenure; that it would allow makers of improvements to patents to compel the granting of licenses from owners of broad and basic patents; that it would destroy the integrity of the patent system; that it would have the effect of preventing patentees from annexing conditions for the exercise of their rights under the patents; that it would restrict the patent monopoly which the constitution says shall be exclusive.

It also was contended that while Congress has the authority to establish the Patent Office, and limit the term for which a paent may run, that it has no authority to put restrictions on the use of a patented article.

Members of the committee sought to confine the arguments to Sections 17 and 32 of the bill, and this suggestion was deferred to as a whole, but those making arguments naturally wandered away, at times, from the propositions involved in these two sections to other parts of the bill; also, to general discussions of patents, their uses and benefits, the trouble in securing them, infringements, contests, etc. Section 17 is that which has reference to the compulsory license feature; Section 32 has reference to the re-sale feature, which seemed to figure largely in the minds of the attorneys, manufacturers and others.

H. Ward Leonard, Lawrence Park, Bronxville; Frank Dyer, president the Thomas Edison Company, Inc., East Orange, N. J.; Edwin Fairfax Naulty, general manager the Fairfax United States Mail Chute System, New York; H. E. Pettit, Victor Talking Machine Company, New York; President Fletcher B. Gibbs, of the National Retail Stationers' and Manufacturers' Association, and others were among the first speakers. Mr. Leonard said that compulsory licenses, in some instances, might work all right and in the public good. He said it would be hard to put into language in the section such provisions as would prevent it acting unfairly.

Grabowsky Assets Double Debts

DETROIT, MICH., April 29—A plan of reorganization is being worked out by the stockholders and creditors of the Grabowsky Power Wagon Company in an effort to put the concern on a sound business basis. The company's trouble has been too rapid expansion. It is explained that the working capital has been tied up in plant and material, and it has been impossible to realize on these fast enough to meet the obligations for supplies as they fell due. It is believed that with the co-operation of the creditors, the difficulties can be straightened out in a short time. At a meeting last week it was decided to select representatives of the creditors to serve on the board of directors and to continue the business along the present lines. The company's liabilities, it is said, are about $400,000 and the assets about $800,000. Prominent among the creditors are the Pruden Wheel Company, of Lansing, and the Firestone Tire Company, of Akron, Ohio., both of which will be represented on the directorate as reorganized.

A statement from the Grabowsky creditors' committee asking for 30 days to formulate a working plan, protecting all creditors in the meantime, has been issued over the signatures of the following: H. S. Firestone, B. F. Tobin, W. K. Prudden, George H. Russell, H. W. Chapin and B. Ginsberg.

Dyer Gets Permanent Injunction

Sweeping in its terms was the interlocutory decree filed in the United States District Court in the case of the Enterprize Automobile Company, of Hoboken vs. Louis Pittsburg, a garage owner of New York. The decree provides for a permanent injunction prohibiting the defendant from infringing the two Dyer patents now the subject of widespread litigation. These patents cover selective gearsets and direct drive under broad claims.

The Pittsburg decree provides for an accounting between the parties for profits and damages alleged to have accrued by reason of the action of the defendant with regard to the patent rights of the complainant.

Tire Chain Injunction Sustained

BUFFALO, N. Y., April 29—Judge Hazel, of the United States District Court has denied the motion of the International Automobile League, of Buffalo, N. Y., for modification of the terms of the injunction issued against the league on behalf of the Weed Chain Tire Grip Company. The league was sued for infringement of the Parsons non-skid patents and sought to have the court change the decree so that it might handle a tire chain of the anchored type.

Denies Violation of Copyright

Answer filed in the United States District Court by the Havoline Oil Company, in the suit brought on behalf of the Valvoline Oil Company, charging infringement of a copyrighted name, is a very voluminous document. Bartlett, Brownell & Mitchell represent the defense and filed the plea. The answer denies formally every allegation of the complaint and states that there has been no violation of copyright. In explaining, the answer sets out the defense that the name Havoline is composed of the first syllable of the surname of John F. Havemeyer in connection with the Latin suffix "oline," meaning oleaginous substance.

A. B. of T. and N. A. A. M. Meet

The regular monthly meetings of the Automobile Board of Trade and the National Association of Automobile Manufacturers were held at the headquarters at 7 W. Forty-second street on Wednesday, May 1. About a dozen members attended the A. B. of T. meeting, which was held in the morning, while fifteen were present at the N. A. A. M. gathering, in the afternoon.

Among the business taken up was the merger of the two organizations, the report on which, while it indicated that progress was being made in the negotiation, showed that the actual details have yet to be arranged.

Allege Illegal Transfer of Funds

INDIANAPOLIS, IND., April 27—Suit to set aside an illegal transfer of $7,955 has been brought in the Federal Court at Indianapolis against the Farmers' National Bank, Shelbyville, by J. Oscar Hall, trustee in bankruptcy for the Clark Motor Car Company, Shelbyville. It is charged that the motor car company, while insolvent, transferred the amount involved to the bank. The transfer is said to have been made 4 months before the company went into bankruptcy.

Market Changes for Week

Sharp Rise in Crude Oil Since First of Year—Rubber Dull—Copper Firm —Lead Unchanged

THE activity in steel products continued throughout the week, but there was no change in price. The industry is now working to 95 per cent. of its capacity, or at the rate of 34,000,000 tons annually. About 30 per cent. of the orders now on hand come from the railroads. During the first four months of the year companies have booked orders for 8,000,000 tons.

While copper was firm without any material change in price, tin soared twice, on Friday and Monday, but suffered a slight setback on Tuesday, so that the week's change does not represent the maximum of fluctuations.

Crude rubber sagged throughout the week, just as it has done for the 2 weeks preceding. Trade was much restricted, with buyers holding aloof. The lowest prices for 6 weeks were quoted when sellers offered up-river fine at $1.12 a pound.

The trade generally is interested in this week's auction at London, when 675 tons of plantations will be offered on the block.

The London fortnightly rubber auction saw from 6 to 7 cents a pound knocked off the former level of plantation prices the average sales being made at 4s.11 5-8d. per pound. Since the first of the year the total sales of plantation grades at auction in London aggregate 5,253 tons against 3,175 tons during the corresponding period in 1911. Up-river Para declined to $1.11 a pound, in the local market.

The upward tendency of the petroleum products market, besides raising the quotation on gasoline, increased the quotation of other oils, for instance, lard. Cottonseed oil, which was subject to considerable speculation during the week, rose 51 cents per barrel for the May product.

The marked rise in the price of crude oil since the first of the year gives ample cause for the prediction of a higher price for the refined products at an early date. Since the 1st of January the price of Pennsylvania crude has advanced from $1.35 to $1.55 per barrel at the wells, according to quotations given out by the Standard Oil Company.

Materials	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Change
Antimony, per lb.....	.06½	.06½	.06½	.06½	.06½	.06½	.....
Beams & Channels, 100 lbs.	1.36½	1.36½	1.36½	1.36½	1.36½	1.36½	.....
Bessemer steel, Pittsburgh, ton	20.50	20.50	20.50	20.50	20.50	20.50	.....
Copper, Elec., lb..	.15 17/20	.15⅝	15⅝	15⅝	.15⅞	.15⅝	— .00 1/20
Copper, Lake Sup., lb....	.15⅞	.15⅞	.15⅞	.15⅞	.15 9/10	.15 9/10	+ .00 1/40
Cottonseed Oil, May, bbl...	6.58	6.75	7.03	7.11	7.21	7.09	.51
Cyanide potash, per lb.....	.20	.20	.20	.20	.20	.20	.....
Fish oil, (Menhaden)	.40	.40	.40	.40	.40	.40	.....
Gasoline, auto., 200 gal @..	.17	.17	.17	.17	.17	.18½	.01½
Lard oil, prime	.80	.82	.82	.82	.85	.85	+ .05
Lead, 100 lbs.	4.15	4.15	4.15	4.15	4.15	4.15	.....
Linseed Oil...	.75	.75	.75	.75	.75	.75	.....
Open-hearth steel, ton...	21.00	21.00	21.00	21.00	21.00	21.00	.....
Petroleum, bbl., Kansas crude..	.64	.64	.64	.64	.64	.64	.....
Petroleum, bbl., Pa. crude...	1.55	1.55	1.55	1.55	1.55	1.55	.....
Rapeseed, oil, refined	.68	.68	.68	.68	.68	.68	.....
Rubber, fine up-river Para, lb....	1.13	1.13	1.13	1.13	1.13	1.11	— .02
Silk, raw Ital	....	4.15	....	....	4.15	....	.....
Silk, raw Japan	....	3.67½	....	....	3.67½	....	.....
Sulphuric acid, 60 Beaumé, 100 lbs.....	.99	.99	.99	.99	.99	.99	.....
Tin, 100 lbs.	44.70	44.62½	45.35	45.35	46.45	46.12½	1.42½
Tire Scrap, lb	.08¼	.08¼	.08¼	.08¼	.08¼	.08¼	.....

Export and Import Totals

March Figures Less Than February's, But Exceed Those of Last March by Nearly a Million

WASHINGTON, D. C., April 30—Automobiles and parts to the value of $2,549,348 were exported from the United States during the month of March, 1912, according to the advance sheets of the Bureau of Statistics, Department of Commerce and Labor. As compared with the total of $2,620,454 for the month of February, 1912, this shows a decrease of $71,106, or 2.7 per cent. A part of this falling off was probably due to the difficulty in shipping cars, especially from Detroit, which began to be experienced in March. Even then, the exports for the month, as shown by the accompanying table, have surpassed in value those of March, 1911, by $910,391, and in the number of cars by 712. It will be observed that Canada continues to lead the world as a consumer of American-made automobiles and parts, having taken $927,256 worth in March as against $774,270 in February, a gain of $152,986. Exports to the United Kingdom fell from $534,398 in February to $314,059 in March, but those to France and Germany more than doubled. German manufacturers want an increased duty on imported cars. The import figures for March, 1912, which are shown together with those for March, 1911, seem very small, almost insignificant, in fact, when compared with those representing the exports for the month. Still, they surpassed those for March, 1911, by $69,254.

COMPARATIVE IMPORTS OF AUTOMOBILES AND PARTS FOR MARCH, 1911 AND 1912

	1911 Number	1911 Values	1912 Number	1912 Values
Automobiles, and parts of—				
Automobiles .....dut..	48	$92,206	69	$161,263
Imported from—				
United Kingdom.....	8	17,314	9	27,511
France	22	39,644	42	96,783
Germany	3	5,976	4	11,282
Italy	4	6,631	5	6,666
Other countries.....	11	22,641	9	19,021
Parts (except tires).....dut..	..	28,623	..	28,020
Total automobiles, and parts of	..	$120,029	..	$189,283

COMPARATIVE EXPORTS OF AUTOMOBILES AND PARTS FOR MARCH, 1911 AND 1912

	1911 Number	1911 Values	1912 Number	1912 Values
Automobiles, and parts of—				
Automobiles	1,510	$1,364,402	2,222	$2,125,565
Exported to—				
United Kingdom	....	330,223	369	314,059
France	....	70,434	97	84,419
Germany	....	14,494	59	40,335
Italy	....	29,016	22	33,893
Other Europe	....	42,779	117	97,918
Canada	....	778,402	911	927,256
Mexico	....	61,161	6	12,496
West Indies and Bermuda.	....	29,255	32	33,853
South America.....	....	74,437	101	112,678
British Oceania	....	83,898	364	334,376
Asia and other Oceania...	....	86,001	98	94,869
Other countries	....	38,847	46	39,413
Parts (except tires).....	....	274,545	..	423,783
Total	....	$1,638,947	..	$2,549,348

Another Cent on Gasoline Price

Announcement has been made by the Texas company that the price of gasoline has been advanced 1 cent a gallon, effective immediately. This advance in price will bring in about $80,000 a month to the company.

While no corresponding advance has been made by the Standard Oil Company, the market for crude oil is very strong and advances of 20 cents a barrel in the basic grades have been made since January 1. The corresponding upward movement in gasoline so far announced amounts to 3 cents a gallon.

Chemical Tariff Changes

Many Items Affected by Proposed Downward Revision Are of Special Interest to Maker and User

WASHINGTON, D. C., April 27—There is now before Congress a proposed tariff schedule for chemicals. This advocates an almost general downward revision, there being but a few materials on which the tariff is proposed to be augmented. Among the great number of chemicals appearing on the schedule the following are of special interest to automobile manufacturers and users:

Material	Present Schedule,	Proposed Schedule,	Proposed Change
Acetone	Unspecified	.01 per lb.	.....
Ammon. carbonate	.01½ per lb.	.00¾ per lb.	—¼c. lb.
Benzol*	.....	.05 per lb.	—5c. lb.
Bichromate pot.	.02¼ per lb.	.01 per lb.	—1¼c. lb.
Calcium chloride	25 per cent	.....	—100 per cent
Castor oil	.35 per gal.	.20 per gal.	—15c. gal.
Caustic potash	.....	.006 per lb.	+6/10c. lb.
Caustic soda	.00½ per lb.	.00¼ per lb.	—¼c. lb.
Chrome green	.04⅜ per lb.	20 per cent†	.....
Cobalt oxide	.25 per lb.	.15 per lb.	—10c. lb.
Glycerine, crude	.01 per lb.	.01 per lb.	None.
Glycerine, refined	.03 per lb.	.02 per lb.	—1c. lb.
Linseed oil	.15 per gal.	.13 per gal.	—2c. gal.
Litharge	.02½ per lb.	25 per cent‡	.....
Paris white, dry	.00¼ per lb.	.001 per lb.	—3/20c. lb.
Pigments, black	.25 per lb.	.15 per lb.	—10c. lb.
Prussian blue	.08 per lb.	.20 per lb.	—20c. lb.
Sulphuric acid	.00¾ per lb.	.....	—¼c. lb.
Talc	35 per cent	15 per cent	—42.87 per cent
Ultramarine blue	.03 per lb.	.20 per lb.	+17c. lb.
Venetian red	30 per cent	10 per cent§	—66 per cent
Whiting, dry	.00¼ per lb.	.001 per lb.	—3/20c. lb.
Zinc oxide, dry	.01 per lb.	15 per cent¶	.....

*And other coal tar derivates. †Not less than 3 cents a pound. ‡Not less than 1 cent a pound. §Or 20 per cent, according to quality. ¶Not less than 6 cents a pound.

Makers Refuse Strikers' Demands

BUFFALO, N. Y., April 30—Declaring that the company would not accede to the demands of the striking coremakers and molders for recognition by them of the union, General Manager Roger C. Adams, of the local plant of the Aluminum Castings Company, stated to THE AUTOMOBILE representative that in the place of the 400 men who are out on strike about 100 out-of-town men have been engaged. Manager Adams said that most of these men are coming from Detroit, where the concern has a branch factory. Local automobile managers stated that, although the strike in the aluminum plant is affecting their operations considerably, as many of the parts that make up a motor car are aluminum castings, the trouble would not hamper the filling of orders of the various automobile factories for machines. Besides their demand that the aluminum plants accede to demands of the union on principles, the strikers have made a demand for $3.25 for a 9-hour day. Manager Adams says this will not be granted.

Railroads Meeting Car Shortage

Announcement has been made by the Missouri Pacific Railway Company that the American Car & Foundry Company, of St. Louis, is building 500 automobile cars and 500 furniture cars for the road. The cars are all 40 feet in length, 10 feet high, with 10-foot staggered doors. The difference between the automobile and furniture cars is that in addition to the side doors the automobile cars have end doors also.

Goodyear Meets Cut in Prices

The Goodyear Tire & Rubber Company has announced that it has met the recent cut made by the Goodrich and Diamond companies. This cut brings the Goodyear standard clincher tires to the same price level as the corresponding grades of the Goodrich and Diamond companies.

The No-Rim-Cut type is 5 per cent. higher than the clincher.

Marion Company Is Sold

Willys-Overland Concern Disposes of Its Holdings to Company Headed by Makers of American

ONE of the most important industrial events of the week is the purchasing of the Marion Sales Company, Indianapolis, Ind., from the Willys-Overland Company by new capital headed by John I. Handley, president of the American Motor Car Company of that city. Up to the present the Marion Sales Company has been a corporate part of the Willys-Overland interests, the Marion car being built in the Indianapolis factory and marketed through the Willys-Overland selling organization. The change means that a new company, to be known as the Marion Motor Car Company, with a capital of $1,000,000, has been organized, with Mr. Handley as president and general manger.

This new company has purchased the Marion Sales Company and will continue the manufacture of Marion cars in the present plant until probably August 1, when a new factory location will be obtained, and the present factory given over to the Willys-Overland Company to manufacture Overland cars for the 1913 season. In the meantime plans are being arranged for new factory facilities. It is understood that John North Willys is interested in the new Marion Motor Car Company as a stockholder. Mr. Handley, who is at present president and general manager of the American Motor Car Company, will continue in this capacity and there will be nothing in the nature of a merger between the American and Marion companies. It is planned that where possible the two lines will be retailed from the same selling agencies, but where separate agencies exist at present little if any effort will be made to bring them together.

Automobile Securities Quotations

Money was a shade easier during the past week, loanable funds being in considerable volume. The spring settlements of merchants generally have been completed. The call rate fluctuated between 2 1-4 and 3 per cent., with the prevailing rate 2 3-4 per cent.

The following quotations on those automobile securities which were most active during the past week in New York and other commercial centers, indicate the situation on April 24:

Name of company	Capital	Par	Rate	Dividends when payable	Quotations May 1, 1912 bid	asked
Ajax-Grieb, com.	$450,000	100	12	M. Jan. 5	115	125
Ajax-Grieb, pfd.	250,000	100	7	S.A. Mar. 5	95	100
Alum. Cast., pfd.	.....	100	*	.....	100	...
Am. Loco., com.	25,000,000	100	7	Q. Jan. 21	44½	44¾
Am. Loco., pfd.	25,000,000	100	7	.....	108¾	109¾
Chalmers Motor	3,000,000	100	5	Q.	140	160
Cons. Rub. Tire, com.	4,000,000	100	*	.....	8½	9½
Cons. Rub. Tire, pfd.	1,149,500	100	*	.....	40	50
Diamond Rubber	10,000,000	100	14	Q. Jan. 20	388	392
Firestone T. & R., com.	3,000,000	100	7	Q. Jan.	255	260
Firestone T. & R., pfd.	1,000,000	100	7	Q. Jan. 15	108	110
Garford Co., pfd.	.....	100	*	.....	98½	100½
General Motors, com.	15,822,330	100	*	.....	34	36
General Motors, pfd.	14,393,000	100	7	S.A. May 1	73¾	74
B. F. Goodrich, com.	30,000,000	100	4	Q. Jan.	82	83
B. F. Goodrich, pfd.	15,000,000	100	7	Q. Jan.	107¼	108
Goodyear T. & R., com.	10,000,000	100	12	.....	239	245
Goodyear T. & R., pfd.	25,000,000	100	7	Q. Jan.	105	106
Hayes Mfg. Co.	.....	100	*	.....	...	104
Intern'l Motor Tr., com.	5,000,000	100	*	.....	33	35
Intern'l Motor Tr., pfd.	3,600,000	100	7	Q. Jan.	93	97
Lozier Motor Co.	.....	100	various	.....	...	65
Miller Rubber Co.	.....	100	*	.....	160	170
Packard Motor, pfd.	5,000,000	100	7	Q. Mar. 15	105	106½
Peerless Motor	1,202,400	100	*	.....	154	156
Pope Mfg. Co., com.	3,690,808	100	1	Jan. 31, '12	35	38
Pope Mfg. Co., pfd.	2,192,202	100	6	Q. Feb. 1	76	77
Reo Motor Truck Co.	.....	10	*	.....	8	9¼
Reo Motor Car Co.	2,000,000	10	various	Feb. Q	22½	25
Rub. Goods Mfg., com.	16,941,700	100	7	.....	22	25
Rub. Goods Mfg., pfd.	10,351,400	100	various	.....	85	...
Studebaker Co., com.	30,000,000	100	*	.....	36	38
Studebaker Co., pfd.	13,500,000	100	7	Q. Mar. 1	97	98
Swinehart Tire Co.	.....	100	*	.....	110	112
U. S. Motor, com.	12,193,350	100	*	.....	6½	7½
U. S. Motor, pfd.	11,491,133	100	*	.....	32	35
White, pfd.	.....	...	*	.....	109	...

Santa Monica Entries

Twenty-three Starters in the Three Classes in Saturday's Races

LOS ANGELES, CAL., April 27—Following is a list of entries for the three events to be decided over the Santa Monica course on May 4:

Event No. 3, Free-for-all, 303.012 miles—Simplex, Bert Dingley; Fiat, Teddy Tetzlaff; Fiat, Caleb Bragg; Fiat, Barney Oldfield; Benz, David L. Bruce-Brown; Stutz, Lewis; Stutz, Earl Cooper; Mercer, Ralph DePalma; Case, Louis Disbrow.

Event No. 4, 161-230 cubic inches piston displacement, 101,004 miles—Reo, H. C. Krause; Buick, Louis Nikrent; Ford, A. J. Charle; Ford, Vic. Roscher; Flanders, Jack Tower; Flanders, Robert Evans; Maxwell, Joerimann.

Event No. 5, 231-300 cubic inches piston displacement, 151.506 miles—Case, Louis Disbrow; Mercer, Ralph DePalma; Schacht, H. A. Shain; Case, Louis Nikrent; Buick, F. E. Devore; Mercer, R. Jeffkins; Midland, F. E. Siefert.

Events No. 1, for cars of 301 to 450 cubic inches piston displacement, and No. 2, for cars of 451 to 600 cubic inches displacement, having failed to fill, have been abandoned.

Endurance Run for Farmers

DALLAS, TEX., April 27—Texas will be making history next August by having the first road run for farmers and ranchmen ever held in the world. This tour will include the principal cities of the state and cover about 1,000 miles. Only farmers and ranchmen who live on and operate their own farm or ranch and who own and drive their own cars will be eligible to compete in this contest. Other cars may, and many are expected, to join the run, but they will not be considered in the distribution of prizes.

The farmers have been quick to join in with the idea, and the first entry was made the next morning after the announcement came out. This was a 30-horsepower Chalmers owned by W. R. Mickle, turkey fancier, who resides in Plano, Texas. Other entries followed in quick succession. A pathfinder, accompanied by a press car, will start out about the 1st of May. There was so much rivalry among the dealers of Dallas to offer this car the selection had to be made by lot. The Case and Kissel-Kars were the winners respectively.

Four Road Races in 2 Days

TACOMA, WASH., April 26—Plans for the two-day race meet in Tacoma are fairly booming, the Festo committee and Tacoma Automobile Club are working together and the latter part of the coming week entry blanks will be ready for distribution. There will be scheduled four principal numbers—a 250-mile race, free-for-all; a 200-mile run for cars of a large limited piston displacement; and 150 and 100-mile grinds for cars of smaller limited piston displacement.

The awards to winners will be graduated to $5,000 for the winner of the free-for-all; $2,500 to the winner of the heavy chassis cars in the 200-mile event; $1,500 to the winner of the medium weight chassis 150-mile event, and $1,000 to the top man in the light weight mill of 100 miles.

North New England Reliability

PORTLAND, ME., April 29—For the first time in the history of automobiling in northern New England, a reliability tour will be run in the states of Maine and New Hampshire in June. For the purpose of holding this contest, the Pine Tree Motor Contest Association has been organized.

The dates for the tour are: Thursday, Friday and Saturday, June 20, 21 and 22. The trophies are offered by the Portland *Sunday Telegram*. The following committee, as officers, will have charge of the event: Referee and pacemaker, A. S. Macreadie; starter and chief observer, Walter B. Parker; chief timer, William N. Taylor; representative of the A. A. A., and chairman of the committee, D. W. Hoegg, Jr.; technical committee, Russell P. Swan, Albert G. Frost and John A. Lester.

American Wins Quaker City Economy Test

PHILADELPHIA, April 27—Notwithstanding a continuous downpour that started shortly before 1 o'clock and continued until Atlantic City was reached, almost all of the forty entries in the fifth annual social run and gasoline economy test of the Quaker City Motor Club today started and reached the finish in good shape, a thorough drenching of all the contestants being the only untoward incident.

No. 13, an American car, driven by W. L. W. Jones, of Coatesville, Pa., won first prize in the gasoline economy test. A rigid examination disclosed the remarkable fact that but 2.292 gallons of gasoline had been consumed for the more than 60 miles of the trip, a rate of 22.07 miles per gallon, which gave the American 9.51 points for general efficiency out of a possible 10. The American's nearest competitor, a Lenox car, William Fowler driver, finished with an efficiency rating of 6.62 and captured second prize. H. Ogle Krause in a Columbia was third. There were six other contestants in this division.

In the social run Otto C. Feil, driving a Packard, proved to be the best guesser, he coming within 25 seconds of the official time, 3 hours 27 minutes 15 seconds, computed by striking an average by adding together the various guesses of the drivers and dividing the total by the number of cars entered. It was stipulated that each guess be between 3 and 4 hours. Mr. Feil's time was 3 hours 27 minutes 40 seconds. Charles Swain, Winton, was second best in 3 hours 29 minutes 3 seconds, and J. Scanlin, Packard, third; time 3 hours, 24 minutes 10 seconds.

The cars taking part in the social run formed in the middle of Broad street south of Locust, facing east. Without a hitch the cars were sent away at half-minute intervals in numerical order from the Broad street entrance of the Hotel Walton by G. Hil-

General view of the start of the gasoline economy division in the Q. C. M. C. run to Atlantic City and return

The tour will start at Portland, Me., on Thursday, June 20, 1912, and finish at Portland, Me., on Saturday, June 22, 1912 and will go via Bridgton, Fryeburg, Me.; North Conway, Crawford Notch, Gorham, N. H.; Bethel, Rumford Falls, Farmington, Skowhegan, Bangor, Waterville, Augusta, Lewiston and Poland Spring, Me. The approximate total mileage for the tour will be 424 miles.

Entry blanks for the contest are now being sent out. A fee of $20 for contestants is required while a fee of $10 is to be paid by non-contestants. Entries will close June 15.

Shows High Efficiency—Lenox Finishes Second

ton Gantert, official starter. Simultaneously with the leave-taking of the social entrants nine cars with sealed hoods left Camden as competitors in the gasoline economy test.

There was one woman driver, Mrs. D. Walter Harper, who piloted a Case car in the social section and finished in excellent time. A special prize was awarded to her.

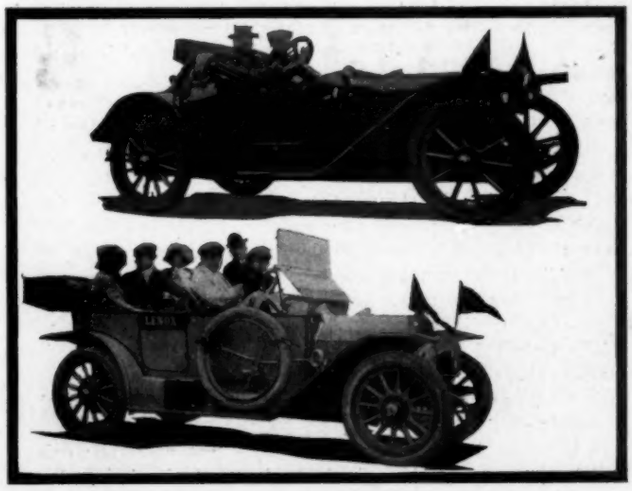
Second in interest only to the outcome of the run itself was the performance of a 1-ton Wilcox truck, which conveyed the tourists' baggage. The truck left the Walton at 1.01, arriving in Atlantic City at 4.29, covering the distance in 3 hours and 28 minutes, arriving before many of the contesting cars.

In addition to the competing cars, an American driven by William Thielen, a Stoddard-Dayton Saybrooke driven by Harry Walls, a member of the winning team in the last Glidden Tour, and a Case driven by Harry Murray carried members of the press. Hugh Hughes in his Mercer racer was another non-contestant.

The route from the Walton embraced Camden, Hadden Heights, Hammonton, Egg Harbor, Absecon, Pleasantville to Atlantic City. Cars were parked on Young's Million-Dollar Pier over night after checking in at the Hotel Strand, the Atlantic City headquarters. Following is a summary of the results.

GASOLINE ECONOMY TEST

	Car	Driver	Miles per gallon	General efficiency
1.	American	W. L. W. Jones	22.07	9.51
2.	Lenox	Wm. Fowler	13.00	6.62
3.	Columbia	H. Ogle Krause	13.38	6.53
4.	American	R. D. Earle	9.94	6.40
5.	Flanders	H. De Grout	18.55	6.26
6.	Moon	E. A. Edwards	11.48	5.99
7.	Michigan	T. R. B. De Quelta	12.33	5.70
8.	American	Nelson Shaw	13.33	5.12
9.	Krit	Albert Rich	14.71	4.98



American, No. 13, winner Q. C. M. C. economy test
Lenox, which captured the second economy prize

Board Allows Records

A. A. A. Recognizes 15, 20 and 25-Mile Dirt Track Figures

GEORGE H. CLARK, the driver suspended for racing at unsanctioned meetings at Ascot Park, Los Angeles and San Antonio, has had his sentence commuted to expire August 1, a remission of 8 months, by the Contest Board of A. A. A.

The 1-mile circular dirt track records made by a Simplex car driven by Disbrow at San José, Cal., have been accepted. The records are as follows:

15 miles	13:30
20 miles	17:57.40
25 miles	22:26.60

The report of the non-stop motor test of a Warren car at Oakland, Cal., under official sanction has been allowed. The car was run on the streets of Oakland and vicinity and was operated continuously from 7:30 in the morning of February 4 to 5:23 the afternoon of March 9, covering 12,404.9 miles on a gasoline consumption of 748 gallons; oil, 48.25 gallons, and 41 gallons of water.

Knight Motors in Racing Field

For the first time in the history of the French Grand Prix, a sleeve-valve motor will be pitted against the poppet valve type of racing cars. Information was received in the United States from Charles Y. Knight, inventor of the Silent-Knight sleeve-valve engine, that the Swiss makers of the S. I. G. M. A.-Knight car had nominated a machine for the great race. Recently a 26-horsepower model Minerva-Knight won the 300-mile endurance contest conducted near Christchurch, New Zealand. The run was across rivers and through mountainous country.

With the addition of the Laurin & Klement of Austria to the list of European licensees of the Knight engine the total is brought up to seven for the Continent and Great Britain. The Austrian company recently obtained the license to make Knight sleeve-valve motor cars for the territory embraced by the boundaries of Austria and Russia. It is the largest automobile concern in Austria.

National Non-Stop Run Proposed

DETROIT, MICH., April 29—America has no great annual non-stop run for automobiles and it is therefore interesting to learn that such an event is to be contested in and around Detroit over a stipulated course under the rules of the American Automobile Association and for a valuable challenge trophy and minor trophies. The run will take place in September. The Michigan State Agricultural Society will make an application this week for the sanction and will offer as the grand prize for the event the Michigan State Fair trophy to be contested for annually.

Preparing for Big Road Races

MILWAUKEE, WIS., April 29—The race committee in charge of the promotion of the Vanderbilt and Grand Prix races hopes to have the official sanction for a course by the end of the week. There is only about a half mile of entirely new road to be constructed, and most of this new work on the Greenfield course, which seems likely to be chosen, would consist of building a new turn at the south end of the diamond. The remainder of the work would comprise widening the roadbed proper, rolling, scraping, grading and oiling. In any event the course would be practically a natural dirt highway throughout, although the promoters may go to the expense of macadamizing the whole stretch which is now proposed.

An offer that is not regarded as impossible to accept by the promoters of the Vanderbilt cup and Grand Prix road races at Milwaukee in September, is that of the Mitchell-Lewis Motor Company, of Racine, Wis., which has promised to give $50,000 toward the construction of a race course, provided that it would be located so as to pass its big motor works in Racine, about 27 miles south of Milwaukee. While the location of the course so far from Milwaukee does not meet with general approval among Milwaukee business men, the $50,000 looks mighty good to the promoters, for it would practically cover the expense of building a course.

Three More Sweepstakes Entries

INDIANAPOLIS, IND., May 1—Entries for the 500-mile sweepstakes will close at midnight. The latest entries include a Lozier, driven by Joe Horan; McFarland Six, driven by Melvin Marquette; Opel, driver not named. If permitted, there will be one additional entry each from the Stutz and National camps, Charlie Merz to drive the third Stutz.

Rose vs. Grossman Discussed

Judge Mayer, of the United States District Court for the Southern District of New York, has entered an order dismissing the case of the Rose Manufacturing Company against Emil Grossman and eleven co-defendants which charged infringement of the Never-Out license pad holder patents.

This suit was filed December 27, 1911, and the reply of the defense was a demurrer. Under equity procedure it is customary for the complainant to call up the demurrer for argument wherein it is the province of the court to rule either for or against the plea. If the demurrer is overruled the defense is obliged to answer, admit the facts in the complaint or to take appeal on the law point. If it is sustained, it may result in the dismissal of the suit.

Lighter Company Claims Infringement

Suit for alleged infringement of patents has been commenced in the United States District Court by the Safety Gas Lighter Company, of Haverhill, Mass., against A. Gutman and G. C. Fuller, of New York. The patents involved are numbered 940,276, 1,011,643 and 1,021,363, covering an improved gas lighter used to a considerable extent in the automobile industry.

The device contains the friction principle embodying the idea of abrading a metal surface with a very hard mineral composition so as to produce a shower of sparks. The chief claim made for the patented device is that the metal member itself is responsible for the sparks and that the corrugations made upon it are not essential to the generation of fire.

Motor Company at Legal Sale

WASHINGTON, D. C., April 30—In the case of the Carpenter Automobile Company, the Bankruptcy Court has awarded adjudication and reference to W. M. Hallam, referee in bankruptcy. Sealed proposals will be received until May 10 by W. H. Conant. C. F. R. Ogilby, Jr., and Joseph D. Sullivan, trustees in bankruptcy, of the Washington Motor Vehicle Company, makers of the Capitol electric, for purchase of the plant and good will of the company.

Forced Sale of Findlay Plant

FINDLAY, O., April 29—Notice has been given of the forced sale at public auction of the plant and equipment of the Findlay Motor Company. The decree of sale was entered by the United States district court for the northern district of Ohio, on April 24. The sale is to take place on June 7 and Fred H. Kruse, of the law firm of Fritsche, Kruse & Winchester, Toledo, O., has been appointed special master. A minimum bid of $137,500 has been fixed by the court.

Redeeming French Roads

Politicians Insist That Automobilists Rather Than the General Public Should Meet Expense

PARIS, April 24—French roads have been going from good to bad and from bad to worse because the system for maintaining them has remained at a standstill while the traffic on them has been multiplied by ten. The roads in the vicinity of Paris are already in a condition denounced as disgraceful, and in the provinces the tendency in the same direction is unmistakable. For some time this baneful deterioration has been realized in automobile circles and some efforts have been made by the French government in connection with the last two sessions of the International Road Congress to point out means, in a technical sense, for counteracting the gradual destruction of a road system which originally was the best in the world. All action has been frustrated, however, through the objection of politicians who thought they represented the interests of their constituents best by insisting that the roads were being destroyed by the automobile owners and therefore should be kept in repair at their expense rather than by general taxation.

At a joint meeting held April 19 the following bodies were united in a new effort for getting public action in this matter, namely: Automobile Club of France, Syndicate of Automobile Manufacturers, Touring Club of France, Bicycle Union of France, Syndicate of Automobile Accessory Manufacturers, Federation of Local Automobile Clubs, Syndicate of Tire Manufacturers, Syndicate of Carriage Manufacturers and Union of Parts Manufacturers. It was decided to print a "National Petition for the Repair and Maintenance of the Roads of France" in 300,000 copies and circulate it for subscription. The principal ideas voiced in this petition are as follows:

Never before have the roads been used by so large a number of vehicles, pedestrians and troops, and never before has there been so urgent need of facilitating road traffic.

The rapid increase in the use of bicycles and even automobiles by all classes of the population is extraordinary and proves that their use represents a vital necessity of daily life which can no longer be suppressed or restricted.

Touring Has Benefited Business

The prosperity which the movement for touring and traveling by bicycle and automobile has brought to many large industries and to small tradesmen should be considered.

The new source of wealth which has been termed *l'industrie des étrangers* and which has greatly benefited our hotel trade springs from the same movement and promises to develop into one of the largest among the revenues of France.

This superb development is indisputably mainly due to our road system, which until very recently was unrivaled, but which is now threatened through the effects of the intense traffic.

Modern road improvements in neighboring countries, especially England and Belgium, threaten the privileged position of France as the favorite touring country. The situation has become alarming, and the national interest demands urgent measures. The maintenance methods actually in use cost large sums each year, but are not suitable for coping with the new conditions of the traffic.

The technical and the popular requirements call alike for a road surfacing more resistent and more homogeneous than macadam, producing less dust and less slush; and the methods of repair should be reorganized.

It is believed that an imposing movement of public opinion will be set on foot through the widespread circulation, largely at hotels and local automobile clubs, of the eloquent petition of which the above is a much abridged extract.

Exports to South America

Review of the Trade Possibilities There and How to Clinch Them—Opening for Electrics

EXPORT trade with South America and particularly with the Argentine Republic is treated in a monograph produced recently by J. P. Santamarina, civil engineer and trade expert, who was delegate to the Pan-American Union from Argentina.

In referring to the possibilities of the automobile export industry of the United States as applied to Argentina, Mr. Santamarina says that to date the American manufacturers have not made much of an impression on the situation, owing to lack of proper aggressiveness, understanding of the local conditions and the poor results that followed the importation into Argentina of the earlier types of American automobiles.

He says that there is a large potential market for high-priced cars in Buenos Aires, Rosario and La Plata and along the main routes leading into those cities where wealthy plantation owners reside, but that the chance for marketing a line of powerful, stylish touring cars priced around $1,800 is most attractive as a factor in large business.

Mr. Santamarina says that a line of electrics would do nicely if properly handled and suggests that one good way to advertise such cars would be to have a stately, blonde American girl, dressed all in white and wearing elbow gloves and a picture hat, drive the car through the parks and boulevards of Buenos Aires to give the senoras and senoritas and perchance the senors as well, an opportunity to see how delightfully such a car can lend itself to the general effect.

There are a few more than 12,000 pleasure cars owned in the republic. These are mostly French, German and English automobiles running up to $20,000 in price. There are several hundred low-priced American cars now in use and the field for such is rapidly broadening.

All cars must be registered and numbered and each must pay a small city tax.

Must Have Experts in Charge

Practically all the best-known foreign makes of automobiles are represented by importing houses and their local branches throughout the republic, except those of the United States.

These houses keep demonstrating cars and a full line of parts and accessories for the use of customers and many of them have garages and repair shops attached. Several houses handle more than one line, but as a rule, only a single make is distributed through each.

Mr. Santamarina advises American manufacturers who contemplate the establishment of exclusive agencies to send at least one expert mechanic who is familiar with the structural features of his line to head the service department. He lays special stress upon this feature and says that past experience has shown that the trouble found by excellent American cars is that nobody was on the ground who knew them intimately during the first year after they were introduced. He says that justice was not done the cars.

The best way to reach the trade, he says, is to establish a branch house in Buenos Aires, equipped with a complete garage and prepared for an extensive advertising campaign. Cars are sold generally for cash, but customers of standing often are given 90 to 120 days for payment. The importers as a rule pay cash against bills of lading attached.

His conclusions are that knowledge of the language and customs of the country are essential; that advertising, merit of the product and even service all combined will not achieve much success unless based upon careful preparation along the line suggested. Ample capital is required if an agency is contemplated and for that reason he favors the factory branch as against the straight agency proposition.

In Argentina the freight vehicle has made considerable progress and its field, especially for heavy trucks, is widening.

In Brazil the truck has been in use for over 5 years with much success, particularly in the coffee industry. The cities of Rio, Para, Bahia, Pernambuco and their surrounding territory are ripe for the exploitation of moderate-priced American cars on a basis similar to that suggested for Argentina. A well-conducted campaign in this region would doubtless bring results.

On the North coast the automobile has made little progress, although the trade is growing at Bogota, Maracaibo, Parinam and Georgetown.

From Panama to Chile the automobile is increasing in popularity although operation is rather high in cost owing to the mountainous character of the countries. American automobiles are practically unknown in several of these countries, but in Chile and Peru several lines are represented.

Late Trade News from Abroad

MOTOR TRACTION ENGINES—There is a good opportunity in a South American country for the introduction of motor traction engines. To give thorough and permanent satisfaction traction engines marketed in the country in question must be able to withstand rough usage, bad weather, and wind-blown sand, and to overcome the difficulties of rough roadbed. Cheapness will not be considered so much as fitness and dependability. A limited number of outfits of less than the capabilities indicated may find a market for use in making short runs to and from a port. Copy of the complete report, containing further detailed information can be secured from the Bureau of Manufactures, Washington, D. C. File No. 8440.

LOWER DUTIES BOOST IMPORTS—Information from Santiago, Chili's principal seaport, shows that importations of automobiles already is showing a marked increase due to the lowering of the customs duty. Sixty per cent. ad valorem has been charged, but February 12, by act of Congress, the rate of collection was changed to 15 per cent. The principal cities of this republic have finely paved streets and there is a field of importance offered to dealers in automobiles. Cars already in use here are largely of European manufacture, but the introduction of American cars is increasing.

AUTOMOBILES IN NEW BRUNSWICK—Several additional automobiles have recently been ordered and a number of others are being negotiated for by people in New Brunswick. Quite a number of new cars will be added to the total in evidence last year. Four will be direct importations from American manufactories; the others of American origin from branch establishments in Ontario, where the parts are assembled and the cars finished. There is also much discussion of a proposition to establish a local garage, with four or five touring cars, to accommodate the public and especially summer visitors to Restigouche camping and fishing resorts.

AUSTRALIAN IMPORTS—There was an increase of over $2,000,000 in 1911 over 1910, in the importation of motor vehicles and parts into Australia, and of $1,000,000 in oil and kerosene.

NEW ZEALAND MARKET FOR TIRES—Sales of various kinds of rubber goods in New Zealand have considerably increased in value during the last several years, as is shown by the following report on motor car tires during the years 1908, 1909, 1910: In 1908, $167,586; in 1909, $149,878; and in 1910, $236,356.

PREJUDICES AGAINST AUTOMOBILES—The contention between the peasants and the motorists in Switzerland becomes more acute each year as the number of cars on the country roads increases. Local legislation has made motoring difficult in some places and impossible in others. These communities are so distributed throughout the country that they make travel by automobile disagreeable to say the least.

Use of Paraffin as Fuel

Interesting Experiments With This Substitute for Gasoline—Difficulty in Securing a Proper Carbureter

Heated Liquid Must Be Separated Into Fog-Like Spray to Secure Best Results

TO use paraffin on the road successfully in the ordinary type of engine, a mean effective pressure and a b. h. p. hour consumption approaching that reached with gasoline must be attained. Many claim to have succeeded in doing this; the writers themselves have had their expansive moments, but sooner or later the results have fallen off or certain troubles have asserted themselves with consequent disappointment.

The problem then is to run an ordinary touring-car engine on paraffin with practically the same ease, flexibility, economy, and power as on gasoline, and to determine the paraffin of highest boiling point usable. The difficulties to be overcome group themselves under two heads:

(a) The ordinary carbureter difficulties due to variation in mixture quality.

(b) The difficulties in vaporizing the paraffin, and holding it up as an explosive mixture.

After consideration and some preliminary experimenting, the writers laid down the following principles to be followed in attempting to make a paraffin carbureter:

1. All fuel should be completely evaporated before entering the engine, although partial condensation might occur after evaporation.

2. The fuel should be evaporated in the presence of some 10 to 20 per cent. of the total air required, and then mixed with the remaining air.

3. That the evaporated fuel before mixture with the main air should be superheated, with the objects—

(a) of producing a fog of extremely fine texture on dilution;

(b) of producing a fixed gas.

Necessity for Fine Atomization

The need of observing the first principle is obvious merely on account of lubrication, particularly in the case of sleeve, piston and rotary valve engines. Further, liquid paraffin on a highly heated surface, such as that of a valve, readily cracks, while the vapor of the same may safely be heated to a much higher temperature without decomposition, and when cracking occurs will form products in such a state of division that combustion is easy and deposition rarely occurs. Although evaporation may be complete in the vaporizer, yet on mixing such a charge with extra air a mixture of a fog-like character is formed. The paraffin condensed in this form has practically no wetting properties, and differs entirely from the coarser particles of liquid formed by spraying the fuel. High thermal efficiency cannot be obtained unless the fuel is atomized as finely as possible; a completely vaporized condition, if possible, is the best. Fuel particles of any size take an appreciable time in burning, and hence burn inefficiently. The burning may easily be incomplete and give rise to further inefficiency, and cause cracking, with deposit or foul exhaust. This action can take place in the case of gasoline, as may readily be observed. A quartz glass window was inserted in the cylinder wall of a four-stroke engine in order to observe the nature of the combustion. The color of the flame varied from a pale blue to a dazzling white flash according to the density and dilution of the charge. With a well-heated carbureter the flame appeared homogeneous, but, when cold, bright streaks of flame could be seen, indicating flaming spots of gasoline being projected across the cylinder.

With the paraffin in the fog condition, it is probable that on compression the fuel is evaporated, for the observers have failed to note in the case of engines running on such mixtures any evidence in the indicator diagrams of want of sharpness in explosion or signs of delayed burning beyond those observable with gasoline.

The second principle depends on the necessity of keeping the charge temperature as low as possible in order to maintain a high charge density and to prevent pre-ignition. If evaporation of the paraffin in the presence of the whole air be attempted, it is necessary to raise the temperature of the whole charge to a temperature approaching that of the boiling points of the heavier fractions. This temperature is difficult to govern, and, as will be shown, it is quite possible for some form of ignition to be set up in the overheated evaporating charge. The troubles and losses caused by this action will be proportionally greater when the whole of the air is concerned than when a fraction is involved. The 10 to 20 per cent. of air used in evaporation acts as a carrier in much the same way as steam or nitrogen when employed in the distillation of organic compounds somewhat unstable with heat. It lessens the tendency to cracking, with the accompanying deposit of tar and coke. In addition, this carrying air exercises a useful function in assisting the mixing of the evaporated charge with the main air with minimum deposition.

Too Much Heat Caused Deposits

Later work has shown that the third principle is much open to question. There is no evidence that a finer fog results from mixing a rich charge at, say, 550 degrees C. with air than from mixing a charge at 300 degrees C.; but there is evidence that where high superheat has been employed a dense, readily depositing fraction occurs which causes the highly superheated charge to deposit in greater quantities than the cooler charge. The quantity of fixed gas producing is disappointing, and its character is such that its production is undesirable.

In spite of this, the first attempts at making a paraffin carbureter were encouraging. The illustration gives a diagrammatic view of the first carbureter. The carbureter was placed on the exhaust side of the engine, with main and carrying air throttles connected. The fuel, with its fraction of air, was fed tangentially into a cylindrical chamber and delivered axially, passing directly through the superheater pipe down the center of the exhaust pipe. The object of the circular vaporizer was to trap all unevaporated paraffin, and prevent it entering the more highly heated superheater and either escaping unevaporated or cracking on the hot walls. The circular evaporator was quite a success, and after considerable use no trace of deposit was observed in the superheater.

The highly-heated charge, now mixed with the main air, was discharged straight along the induction pipe so as not to impinge on any surface. The temperature of the mixture entering the cylinders varied from 60 degrees C. to 80 degrees C.

Other modifications of these parts were used, but it was noted that for slow running the most successful results were obtained with the evaporator on the engine side of the throttle. This

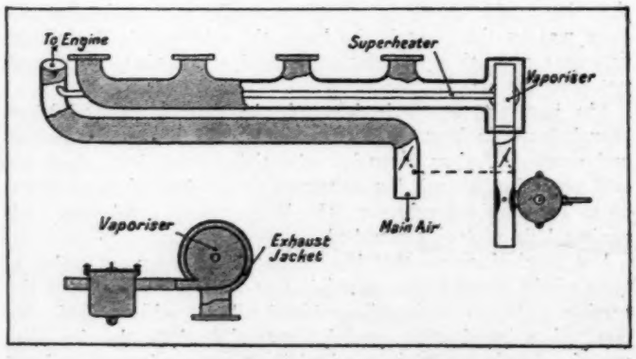


Diagram showing section of a paraffin carbureter

form of carbureter was tried out on the road and on the bench.

The chief points noted in running were:

1. The exhaust was generally clean and odorless.

2. The engine showed no signs of deposit other than those due to lubricating oil, except on two occasions, one when an attempt was made to start the engine from cold on a mixture of gasoline and paraffin, and another when an attempt was made to run the engine on crude oil.

3. The highest mean effective pressure was 70 pounds per square inch.

4. The plugs were clean, but showed signs of high temperature. In one case the electrode was found to be fused away. It should be noted that the engine was then running at 1600 revolutions per minute under four-fifths load.

5. The engine was capable of high speeds, and yet could pull down to quite low speeds.

6. Carbureters evaporating on the engine side of the throttle were much more successful at low speeds than those evaporating outside the throttle.

7. The exhaust was observed from time to time suddenly to rise in temperature, the pipe becoming red-hot. This was accompanied by a tendency of the engine to knock, together with a loss of power. The engine would become unsteady, and sometimes lose its power, giving the impression that the brake had been steadily loaded up. The effect on the exhaust valve was marked and destructive.

8. After such overheating, a curious kind of popping, differing from that due to weakness of mixture, was observed in the carbureter.

Raincoat Succeeds Mackintosh

There is evidence on every hand of the popularity of the raincoat, which has so largely replaced the mackintosh. High prices for rubber and too free resort to unsatisfactory rubber substitutes explain the discredit into which the cheap mackintosh has fallen. Porosity, cheapness and some other virtues account for the ubiquity of the rubberless rainproof. The cheapest kind of double-fabric waterproofing with rubber and its substitutes is understood to cost 36 cents a yard; which sum will pay for rainproofing 12 yards. The rain or shower-proof treatment is not new, and this is not the first burst of popularity the raincoat has enjoyed, but the details may be stated for any interest they possess. Cloth intended for raincoats is treated in continuous machines, which impregnate the fabric thoroughly with acetate of alumina. The chemical, although highly soluble in water, and hence evanescent in its effect, itself markedly improves the original resistance offered by the cloth to the passage of water. Coming out of the series of baths in which the impregnation takes place, the cloth is dried more or less effectually by suction and heat. It thereupon receives a coating of wax, usually compounded of paraffin wax of high melting-point and some harder waxes. According to one system the wax is applied frictionally and dry; in another the wax is melted and applied in an infinitesimally fine film from the face of a small roller. The wax is a separate rainproofing agent, and it helps to lock the soluble chemical within the fibre.

Cotton, silk, linen, and wool are treated substantially in the manner described, and not always for coat makers. Tent-cloths, awnings, and sail-cloths are sometimes rainproofed; balloon and aeroplane fabrics are 'proofed to prevent the development of mildew from wetting. Even tire fabrics for automobiles, and rugs destined to be lined with a rubber film, are first given this upper form of protection. The habit of riding in covered vehicles has reduced the necessity for wearing wind- and watertight overcoats, and the fact has been presumed upon. A dozen years ago the name "rainproof" fell into undeserved disrepute when thousands of pieces of cloth, which had undergone no efficacious rainproofing process, were stamped with the word "rainproof" and sent out to disgust the public.—*Journal of the Royal Society of Arts*, April 5.

A Comparison of Rubbers

Study of the Merits of the Product From Different Sections Shows that the Brazilian Variety Is Best

Growing Importance of Rubber Seed Kernels in the Production of Drying Oils

THE Imperial Institute has compiled a selection of reports relating to the composition and quality of the rubber furnished by well-known rubber-producing trees grown in different countries, and under different climatic conditions, and prepared in different ways. On the whole, the cultivation of *Heva Brasiliensis* in the districts suitable for its growth is more profitable than that of any other known rubber tree, and the product holds a great advantage as against the rubber collected from wild vines and other rubber-producing trees, owing to its purity and greater elasticity and strength. In an introduction to the report, Mr. W. R. Dunstan, Director of the Institute, says:

"The rubber-planting industry is now in a transition stage, and is faced with several problems which will only be satisfactorily solved by systematic research, much of which must necessarily be conducted on the spot. It is a welcome and hopeful feature that this need for investigation is generally recognized, and not only are these problems being attacked by the Government Agricultural Departments in the Tropics, many of which are conducting investigations in conjunction with the Imperial Institute, but many of the larger plantation companies have engaged the services of scientific specialists to conduct investigations into the important problems of tapping, coagulation, curing, and the large subject of the hygiene and pathology of rubber plantations,

Rubber Replaced Gutta Percha

So long as rubber commanded a high price, considerable importance attached to those plants which furnished even a relatively small amount of this material, since the profitable separation of the rubber from resins and other foreign substances naturally associated with it in the latex was commercially possible. With a very considerable fall in the price of rubber, and with a greatly enhanced production of first-class rubber, these secondary and inferior sources of the material are less likely to be of importance. A number of such products are alluded to in the reports, some of which also relate to gutta-percha, which is closely allied in some respects to rubber, and was once very extensively employed and purchased at a high price for certain electrical purposes. Now, however, the commercial position of gutta-percha is greatly changed, owing to the fact that rubber itself, in combination with other substances, can be employed for many of those purposes for which gutta-percha was not long ago alone suitable.

"Lastly, reference is made to the investigations conducted at the Imperial Institute into the value of the seeds of the Para rubber tree as a source of oil. It is now some years since the oil contained in these seeds was first investigated as to its composition and uses at the Imperial Institute. It was shown that the kernel of this seed, which is easily removed from the thin shell, contains nearly half its weight of oil. This oil was found closely to resemble linseed oil in its composition and properties, falling into the class of drying oils, which are used in the manufacture of paints, of linoleum, and of other materials. It was shown that this oil would command about the same value as linseed oil, and that there would be a considerable demand for it as a substitute for linseed oil. With the maturing of large rubber plantations all over the world, the need for seed for planting is rapidly diminishing, and an enormous quantity is becoming available.—*Journal of the Royal Society of Arts*, April 12.

Test to Decide If Rims Should Be Elastic

An Inquiry to Obviate Wire Wheel Construction Too Fine-Drawn for Variable Roads and Loads

Subject Leaves Wheel Weight and Its Distribution in the Second Line

ALL possible arguments for wire wheels are taken before the public in the agitation which is at present carried on in England and France with a view to making the wire wheel once more the standard equipment for automobiles, and, in the give and take of reasons pro and con, weak arguments and undocumented allegations of facts are being weeded out. The saving of tires by wire wheels is disputed; their smaller weight likewise. Their superior strength for some strains is admitted, but is coupled with a requirement for very exact manufacture and a suspicion of weakness under other strains. It is conceded that the wire wheel can be repaired more conveniently than the wood wheel, but it is held doubtful if repairmen will ever be available, outside of the factories, who could be trusted to true the tension of the wire spokes in a repaired wheel. The best relations between the strength and rigidity (or elasticity) of the steel rim and the corresponding properties of the wires have not been determined, and unless the rim can yield sufficiently, in its own plane, to transmit strains due to shocks of travel to a large number of the spokes, most of the dynamic advantages of working with tension instead of with compression stresses are forfeited.

This consideration comes up in deciding whether the wire wheel will save the ball or roller bearings in the wheel hub more, when severe shocks are received, than the wood wheel does.

The wood wheel transmits the shock direct through the wood spokes nearest to the point of impact on the tire, and all the force of the impact, only cushioned by the tire, practically reaches the bearing members; and it depends mainly upon the rigidity of the outer bearing member whether it shall reach many or only one or a few of the bearing balls or rollers.

In a wire wheel so constructed that the rim is quite rigid, in its own plane, independently of the tension of the wires, a road shock travels through the rim, tending to displace it with relation to the hub, and meets no decided resistance before it reaches the diametrically opposite portion of the rim, where displacement is resisted by the tensile strength of the wires running from that portion to the hub flange. As the wires nearest the point of impact have been flexed more or less and offer little if any resistance, the brunt of the shock thus reaches the bearing members practically in the same manner as in a wood wheel.

If, on the other hand, the rim is not so rigid but that it would ovalize under the shock, were it not for the tension of the wire spokes, then the strain of the shock tends first to produce such ovalization, and when this effect is resisted by nearly all the wire spokes in the wheel the shock is spent in these and they pull upon the hub from all directions, though in somewhat unequal degree, and almost completely relieve the bearing members from strain.

Rim Materials and Wear of Tires

It does not seem to be important with regard to these strains upon the bearing members, particularly the steel balls if such are used, whether the hub flange to which the interior ends of the wire spokes are attached is capable of yielding resiliently or not, the whole question hinging upon the rim's natural flexibility in its own plane, which is the property by means of which it transmits tensile strains to nearly all the spokes, rather than to a few and in one direction only. Any shock which reaches the hub acting in a single direction, whether by pushing a wood spoke or by pulling two wire spokes, tries the workmanship and taxes the strength of the bearing, but, as the wire wheel rim, as a rule, is susceptible of some deformation and endowed with some resilient resistance to such deformation it does to that extent protect the wheel bearings. From this point of view, the virtues of the wire wheel seem to depend largely upon the material used in its rim. And as the sharpness of the shocks to which the tire material is exposed corresponds closely—as reaction to action—to the sharpness of the shocks transmitted to the bearing, the matter of tire wear with wire wheels seems to depend at least in part on the same factor.

It is in accordance with these considerations that the Rudge-Whitworth, Ltd., company, of Coventry, England, who may be looked upon as leaders in the battle for wire wheels, insist upon the superior flexibility of the rims used in their construction. They say about a wheel built on this principle that "like a tire it flattens under load, and like a tire it deadens shock." . . . "On the other hand," they say in another place, "the spoke tension, like the air pressure in a tire, should not be too high or their cushioning effects are not realized."

All the data seem to converge in support of the assertion that a wire wheel can be made mechanically superior to a wood wheel if it is properly attuned to its work and provided its possible weakness against certain strains, which may be exceptional, but which may yet occasionally arise in traffic, are eliminated. Reference is made especially to the lateral strains at turns, which perhaps usually attack the wheel on the outer arc of the turn and from the outside, but which may attack the wheel on the inner arc from the vehicle side—all according to the formation of the road surface. Strains which are possible, of course, cannot be neglected just because they may be rare on ideal roads. It is stated that strains of this character, and those very similar ones which may set in at any moment when a car is driven over a road full of frozen ruts, have now been met by means of a new quadruple stringing of the wire spokes.

Simple Test of Wire Spoke Action

The degree of finality in mechanical trustworthiness automobile manufacturers must insist upon when contemplating a change in an important construction feature in connection with a vehicle which by careful plodding and painstaking selection has been made quite reliable in nearly all other features, seems in the case of the wire wheel to be still awaiting the finishing touches of a more amplified experience and a more generalized standardization of design. There is ample time for a change, since the wood wheel is quite acceptable and a new type of wheel made from pressed sheet steel also seems to be making its way toward recognition, and in the meantime it might be advisable to determine by simple practical experimenting some of the questions which pure reasoning scarcely trusts itself to answer without wavering. To decide the question, for example, whether the wire wheel saves the wheel bearings and therefore makes smaller demands upon the spring suspension of the vehicle than a wood wheel does, an experiment as sketched in Fig. 1 should be of value.

From the beam A there is suspended the weight B by means of a double or forked rod H which may be raised to a predetermined position, as indicated in dotted lines. The wheel to be tested is similarly suspended in such manner that the inflated tire is just in contact with the weight B in the rest positions of both the weight and the wheel. The weight B may be hoisted to a uniform height from which it is to be dropped by means of any preferred device provided with an automatic release. A short axle is placed in the wheel hub bearings, and to this axle is also attached the double strut E, of which the other

end is journaled to the weight D, and the latter is suspended from beam A in such manner that the weight D does not touch the wheel. The curved ratched rack F is so arranged as to arrest and hold the pawl G when the latter is swung to the side by means of pin K on the double rod J so as to indicate by the position in which the pawl is left the force of the shock by which the weight D has been displaced.

To decide whether a wire wheel absorbs any notable portion of a road shock in its construction elements and therefore transmits so much less to its bearings and from these to the wheel axle and the rest of the vehicle, the wheel should be shod with a pneumatic tire and the latter should be inflated to standard pressure. If now the weight B is dropped against it from a given height, whatever shock reaches the wheel axle will be transmitted through E to the weight D, and the position in which pawl G is found after the shock will afford a comparative measure of the shock. By varying weight B a number of different notations will be obtained for a given weight of D, these notations corresponding to road shocks of different severity. And by subsequently varying the weight D and repeating the variations of B for each value of D several series of figures will be obtained corresponding to variations in loads and spring suspensions with which the wheel might be used in practice.

By repeating this series of simple tests with a wood wheel instead of the wire wheel, it would be seen under what conditions the wood wheel transmits greater shocks to its own bearings, as well as to the vehicle springs and the load, and under what other conditions the service of the two types of wheel would be more nearly alike or would show in favor of the wood wheel. Evidently the pneumatic tire and its inflation should be the same in both series of tests, as well as in any tests intended for mutual comparison.

The Static Load Another Factor

Tests of this nature have the advantage of extreme simplicity, which is of the greatest importance. The simplicity is obtained, however, only by leaving unconsidered an element which it would not do to leave out of a final test. This is the effect which the static load might have on the whole showing in both types of wheels. As the wheel is suspended its spokes are virtually under equal tension, but in practice the spokes of a wheel in service are always under unequal tension when a shock is received, by reason of the constant static vehicle load which tightens the upper wires and relieves the lower ones.

The tension of the spokes in a wire wheel must, of course, always be so great that the load alone can bring about no appreciable deformation of the wheel, since such deformation would result in a constant waste of power, and it seems to be one of the delicate points in estimating the possible advantage of tensile suspension, whether the rigidity implied in this necessity may be combined in a practical manner with any notable absorption of shock stresses in the wheel itself. Unless it may be shown by practical test that a mainly potential elasticity—that is, one operating within the limits of purely micrometric elongations and contractions of the wire spokes—is sufficient to distribute strains among a large number of spokes, the conception of the wire wheel as a saving element in the suspension of a vehicle must be abandoned so far as the shocks received in the plane of the wheel are concerned.

The simple tests suggested might show a decided advantage for the wire wheel, and this advantage might then be tested further under variations in the tension of the wire spokes. If the showing continued favorable, thereby indicating that the advantage was not limited to an impracticable uniformity in loads for a given set of wheels, the result might be considered as practically conclusive, and a great gain would have been made in settling definitely one important mechanical reason for giving continued preference to suspension wheels and working for their further evolution. The advantage in getting all the benefits of an elastic suspension without those deformations of parts and those variations in the load-level which usually accompany such benefits would be too great to be easily renounced.

But if, on the other hand, the simple tests were to show no decided advantage for the suspension principle or an advantage limited to shocks of a certain force bearing narrowly circumscribed relations to the tension of the wire spokes, it would be necessary to examine a little more deeply into the subject and see if perhaps after all the wire wheel in practice has an advantageous action by reason of the fact that the static load of a vehicle releases the tension of the lower spokes in the wheel and thereby imparts a considerably enhanced degree of flexibility to the lower semicircle of the rim. A series of tests more complicated than those outlined would be necessary to determine the importance or non-importance of this element.

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Among the New Books

POWER, by Charles E. Lucke, Ph.D., Professor of Mechanical Engineering, Columbia University. Published by the Columbia University Press of New York. 316 12mo pages with 223 illustrations. Price, $2.

How far we have developed in an industrial sense is shown by Professor Lucke in this work. The mechanical servants that men have harnessed to do their bidding are not taken up in detail, the aim of the author being merely to show along what lines progress has been made and to point out by this means what will determine the course of future events. The victories of peace are shown to be of far more lasting importance than those of the armies of warring nations. The relation of mechanical power and machinery to modern social conditions is considered in the first chapter. The food we eat, our water, clothing, shoes, furniture, even the houses we live in, are power-produced. The effect of all these on civilization is analyzed. The remaining chapters are devoted to a study of the latest methods used in the different types of machinery as contrasted with the earlier methods and a study of the economic consequences of these developments. The problems entering into the conducting of a modern industrial plant, the payment of the working force, etc., are lightly touched upon in order to show some of the vital consequences entailed by the employment of a large body of more or less organized labor. The book, as a whole, gives an analytic view of the scientific progress of mankind. It is not a text book, but the compilation of a series of lectures which hold the reader's interest throughout.

BEARINGS AND THEIR LUBRICATION, by L. P. Alford, M. E., Editor, *American Machinist*. Published by the *American Machinist*. McGraw-Hill Book Company, New York, sole selling agent. 235 pages, 6 x 9 inches, with 131 diagrams and cuts. Price, $2.50.

More than a complete handbook on the subject of bearings, bearing metals and the proper oils to use under given conditions, this work takes up the underlying principles of bearings having either sliding or rolling contact. It is an extraordinary collection of data arranged in a logical and clear manner for the use of the student, engineer or designer.

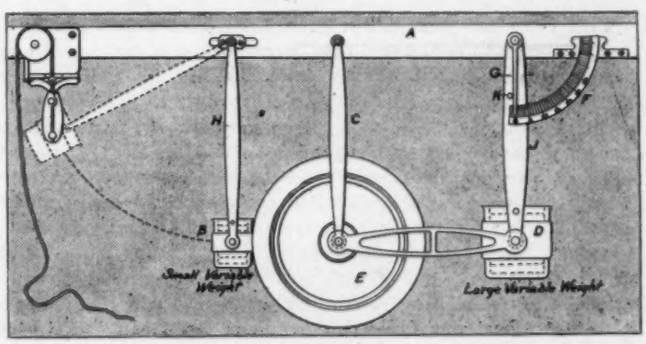

Fig. 1—Sketch of method suggested for a preliminary series of tests to decide the relative merits of wire and wood wheels with especial reference to stresses acting in the wheel plane

DURING the summer season when long automobile trips are made, and when tires are taxed to their limit of endurance, proper care of them and consideration for their life will well repay the automobilist who would save as much as possible on his tire bills.

The reputable tire maker guarantees his tires against faulty workmanship and material for 3,500 miles, but if they are properly taken care of they will easily give 6,000 miles in average cases. One instance, at least, is recorded where a tire ran 17,000 miles in ordinary touring car use.

To get the most out of tires, a number of points must be remembered, and in this and some of the following issues of THE AUTOMOBILE *readers will be given practical hints as to the ways of getting the best results from tire equipment.*

No single factor has more to do with tire depreciation than improper inflation. Nearly half the cars in use run on tires which are inflated below their normal pressure. Some automobilists seem to be afraid to put sufficient pressure in their tires on account of the mistaken idea that they can burst them by so doing. Others are of the opinion that, when properly inflated, tires lose their resiliency and are no better than the solid type.

The following inflation table will serve to give the proper pressure in pounds per square inch for the more common tire sizes and for any given load on the wheels:

Tire size	Load per wheel	Inflation pressure
3 inch	300— 500 lbs.	65 lbs. per sq. in.
3½ "	400— 800 "	70 " " " "
4 "	650—1,100 "	75 " " " "
4½ "	700—1,300 "	80 " " " "
5 "	1,100—1,600 "	80 " " " "

The figures here given represent average values covering practically all the prominent makes of tires. In cases where the manufacturer gives special inflation tables, it is advisable, of course, to use the particular values which have been set down by him.

Valve Must Seat Accurately

There are several ways in which pressure in a tire may be reduced, even where there is no noticeable leak. Therefore, it is wrong to simply inflate the tire to its proper pressure and then forget all about it. Test the pressure from time to time to assure yourself that it has not decreased. To the man who is careful of his tires, an accurate tire pressure register is indispensable. Many a useless tool in the equipment of the car could quite properly give up its place to a tire gauge.

One source of leakage is in the valve itself. It must seat properly or there will most surely be a loss of air. If the seat is not clean and there is dirt on it, the rubber washer cannot fit tight enough to hold against the air. Then, too, the thread may have been mutilated by too strenuous use of a wrench in tightening the stem. The rubber washer must also be in place.

It is a common belief that the temperature of the air outside has a marked effect on the pressure within the tire. It is true that the confined air expands with the increase of this temperature, caused by traveling over hot pavements and roads on hot days, but this pressure increase is so slight that it may be disregarded. More harm is caused to the tire by letting out some of the air and thus running with them in an under-inflated condition than results from leaving it as it was with the slightly added pressure due to expansion. New tires, after they have been in use for a short time, expand slightly, so that their pressure will be somewhat diminished after they have run for some time.

Inflation above that for which the tire was designed is as great an evil as under-inflation, for the fabric and the rubber are both strained. Flexibility is also sacrificed by having the tire blown up to an undue pressure, and the tire becomes no better than a solid type so far as its ability to absorb road irregularities is concerned. Then, too, when the tire is over-inflated the engine, and, in fact, the whole mechanism of the car, is subjected to road jars which will make depreciation very rapid. Even with slow-moving trucks depreciation due to the necessary use of solid tires is very great. Consider, then, the greatly increased racking of the higher speed and frailer pleasure vehicle.

Over-inflation, in a word, robs the tire of all the beneficial effects for which it is designed.

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Remedy Small Tire Cuts at Once

The need of constantly and painstakingly watching the tires if it is desired to cut down expense has been mentioned in these columns on other occasions, but the matter of neglected small cuts in pneumatic tires has not been given sufficient attention by the majority of those to whom a saving in the upkeep expense of tires means much. When a small cut is discovered in a casing it is not necessary to remove the tire in order to repair it, but by means of a simple plastic preparation, which may be bought in any supply store, the repair may be readily and efficiently made. With even a small cut the inner fabric is open to the action of the sand and water which find their way into the vitals of the casing, its life being thus very seriously impaired. When the fabric has started to go nothing will save a tire unless elaborate repairs are made which approximate what a whole new tire would cost. If there was some good substitute for the pneumatic tire on the market, one that had the resiliency and the elasticity of this type of tire, it would be welcomed with open arms by the car manufacturer, as well as by the consumer; but as the matter stands now, nothing can equal the pneumatic tire for pleasure automobiles, and the high first cost will have to be minimized by making the tire last as long as possible. Rigid attention to the small cuts which appear is the best way to do this. It is, in fact, the only method by which the expense can be cut down to a minimum. Before the damage reaches the state where it is necessary to vulcanize there is a great chance for the practical man to reduce the cost of upkeep to a considerable extent. Vulcanizing is more or less of a fine art; it is a process which requires a considerable amount of practice before the average operator becomes expert enough to make a good job. It would be very profitable, however, for the car owner who has the time and takes a delight in tinkering with his vehicle to invest in one of the many forms of handy vulcanizers which are at present on the market. The cost of upkeep of the car will be materially reduced by the use of one of these articles and at the same time the repairs which are made will be permanent instead of only temporary, as patch repairs such as described above must of necessity be.

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Tire Care in Driving—While driving, the greatest damage may be done by not carefully avoiding the many causes of rapid wear. One of the greatest of these is driving in ruts. The rut-worn tire is a very familiar sight to those who live in a dirt road country, where there are deep tracks worn by the many vehicles which pass over the same path. The tread of the tire will be unharmed while the sides will be scraped and torn to such an extent that the inner fabric will be exposed in many spots. This wear on the sides of the tire is not alone occasioned by traveling in the ruts of the road, but will also be caused by habitually making close turns when approaching the gutter; that is, the wheel nearest the curb will scrape against the stone and wear the tire very quickly. The sides of the tire, although they are very strong, are not protected by a thick, tough covering as is the tread.

Finding the Motor Speed

Relation of Wheel Diameter to Engine Speed—To Find a Car's Maximum Speed at Certain Gear Ratios

IT is frequently of interest to the automobilist to know at what speed his motor is running for any given speed of his car. An approximate idea of this crankshaft or engine speed helps the driver to get the most efficient service out of his engine, since he can tell at all times just how fast he is driving it.

The curves given in Fig. 1 offer a simple means of arriving at the crankshaft speed for any car speed. They apply to a gear ratio of 3 to 1 on high gear.

To find any engine speed, the rear wheel size must be known as well as the speed of the car. Determine the latter from the speedometer, and, knowing the former, the curves are easily read.

Suppose the speedometer indicates a speed of 15 miles an hour, and there are 36-inch rear wheels (diameter measured outside of the tires). Referring to the curve for 36-inch wheels, the crankshaft speed is found to be 420 revolutions a minute. If the car is going at 30 miles an hour and the wheels are 40 inches in diameter, the engine speed is seen to be 760 revolutions a minute.

The ordinary automobile motor is designed for an average speed of about 1,200 revolutions per minute. Yet in speeding up to 50 or 60 miles an hour the engine is driven much faster than the rate for which it was designed, even with the larger sizes of wheels, as will be readily seen from the chart.

Another point which is brought out by these curves, and which, while it may be well enough known, is not given much consideration, is that the wheel diameter plays an important part in the speed of the engine. For example, consider two cars traveling at the same speed of, say, 30 miles an hour. One is equipped with wheels 32 inches in diameter and the other with 42-inch wheels. The engine of the former must run at a speed of 950 revolutions a minute to maintain this rate of travel, while the motor of the latter is required to run at a speed of only 760 revolutions a minute. It might be said, therefore, that a car equipped with 42-inch or 44-inch wheels is less apt to have an overheated motor after a long run than one which runs on such sizes of wheels as 32-, 34-, or 36-inch diameters.

If it is desired to obtain the engine speed of any car not having a 3-to-1 gear ratio, the chart may also be used. Take the crankshaft speed as given on the chart corresponding to any rate of travel, and divide it by 3. If the gear ratio is 2 1-2 to 1, multiply this result obtained above by 2 1-2; if the ratio is 4 to 1, multiply it by 4, and so on.

For example: Suppose it is desired to get the crankshaft speed for a car traveling at 45 miles an hour, the car having 36-inch rear wheels and a 2 1-2-to-1 gear ratio, when it is traveling on high gear. By referring to the chart, the crankshaft speed on the 36-inch wheel curve corresponding to 45 miles an hour is 1,260 revolutions a minute. Divide this result by 3, thus getting the figure 420. Now multiply 420 by 2.5, which will give 1,050 revolutions per minute as the speed of the motor, the result desired. In the same way any other combination may be obtained from the chart, if the rear wheel diameter and the speed of the car are known.

The chart may also be used to determine the speed a car is capable of attaining when the motor is running at a given speed.

Suppose it is desired to get the rate at which an automobile will travel when its motor is turning over at the rate of 900 revolutions a minute. The car has 38-inch rear wheels, and the gear ratio is 3 to 1. Refer to the diagram and note the car speed on the 38-inch curve corresponding to the given crankshaft speed. It is found to be about 34 miles an hour. If the gear ratio were 4 to 1, the car speed would be obtained by dividing the result by 4 and multiplying by 3. This would result in a speed of 25 1-2 miles an hour.

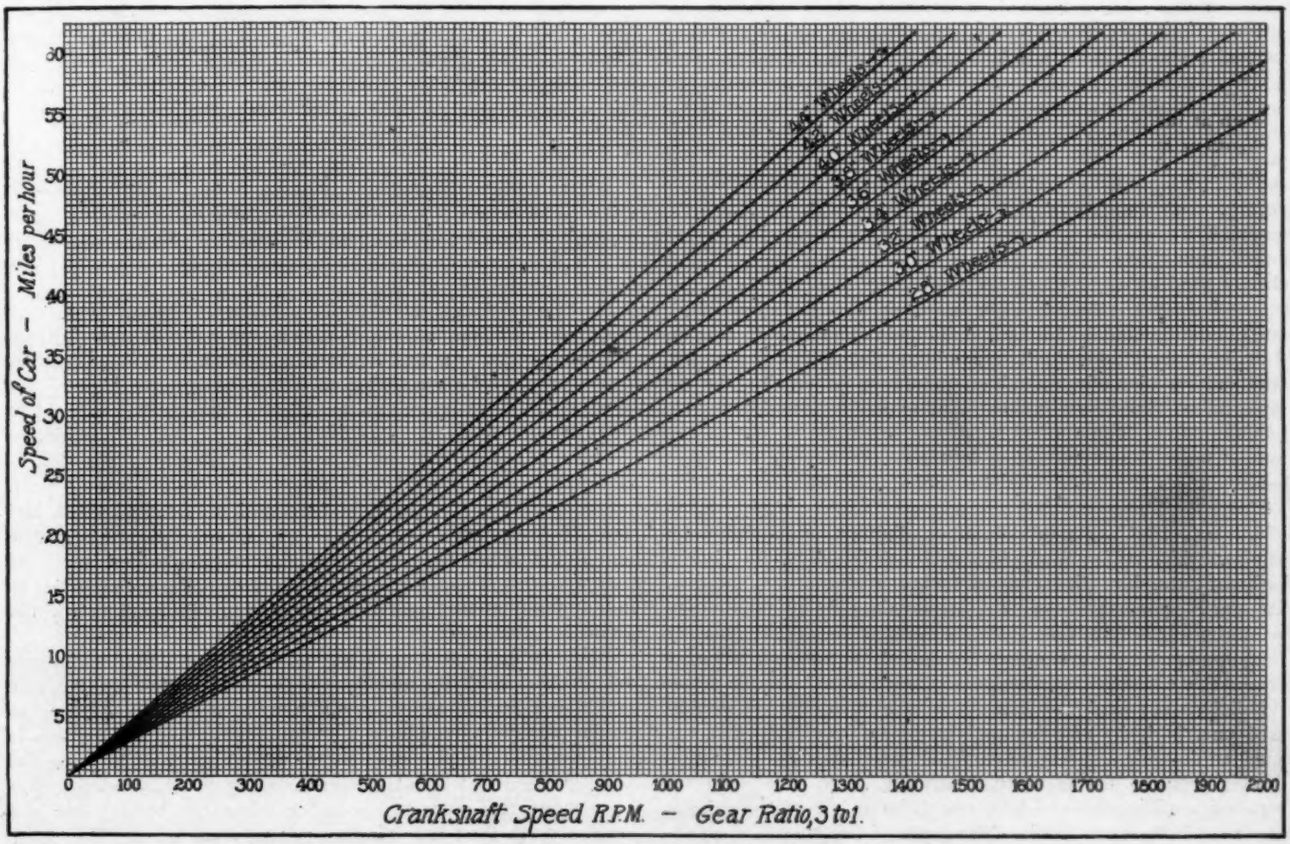

Diagram showing how to ascertain engine speed at any given rate of car speed, and vice versa

Germans Boast of New Instrument to Enable Every Workman in Automobile and Other Shops to Measure His Own Work Quickly and with Superior Accuracy—Tension of Wire Spokes—Eight-Cylinder Motors

IMPORTANCE OF INFINITESIMALS—Although the average automobilist cannot bring himself to feel personally interested in such hair-splitting meaurements as 1/100 part of a millimeter or 1/2000 part of an inch, the ability on the part of a manufacturer to gauge these infinitesimal dimensions quickly and accurately is really one of the fundamental conditions for producing excellent and durable automobiles at low cost. Unless he can place in the hands of his workmen and operators of machine tools suitable mechanical and semi-automatic means for giving metal parts their exact dimensions never varying beyond the limits mentioned and in some cases with an even much higher grade of accuracy, some elements of the greatest importance to the automobile owner are sacrificed. Perhaps the vehicle is marketed with all its inaccuracies, but, more likely, a large amount of slow and painstaking hand work is resorted to in the assembling of the vehicle to bring about the accuracy which the machine tools failed to produce; and in that case the purchaser will get a vehicle which necessarily is of high cost and in which the mechanical excellence which forestalls trouble and rapid wear may be more or less pronounced, according to how well the workmen were disposed when they fitted its parts together. He will also have a vehicle which, when eventually the time for repairs comes, must be repaired by the same expensive processes by which it was put together in the first place. No spare parts are sure to fit it. So as not to be too much at the mercy of the machinist at the repair shop or of his chauffeur he must look out, when he buys the vehicle, to get one in which only the most expensive steels are used, to the end that the day of repairs may be postponed as long as possible; for the repairs of such a vehicle—a work of art as much as of modern automobile engineering—always involve the risk of marring the sweet functioning of its parts through the intervention of a clumsy hand or a clumsy conception of the requirements.

On the other hand, the automobile whose parts have been made interchangeable with corresponding parts taken at random from the stock—the accuracy being the result of a special organization of work methods—may always be repaired by the replacement of parts and may be kept as good as new indefinitely by this means. Moreover, as repairs are not to be feared, it need not be made from superlative materials the tooling of which greatly raises the cost of production.

TROUBLES IN CUSTOMARY METHODS—Writing from this point of view, which so far has had its strongest representatives in the United States, Mr. Riesz, an automobile engineer of Cannstatt-Stuttgart, comments upon the shortcomings in the customary measuring methods and upon the new means devised in Germany for organizing a high degree of accuracy in manufacturing processes.

Most important is the devising of instruments which may be used unerringly by any ordinary workman. Anybody who has much to do with accurate measuring knows what strained attention is required for measuring anything twice alike in 1/100 parts of a millimeter, and how two different persons practically never reach the same result. The sense of touch in one operating the adjustment screw of a micrometer becomes unreliable by fatigue and varies in different persons, and this alone accounts for variations up to 1/200 part of a millimeter. In using a slide caliper or a jaw caliper with tolerance the actual deviations of a piece from the normal measurement are never really defined; the operator simply fumbles around in the vicinity of the right measurement and is thrown back upon his judgment.

In the case of a part to be ground, for example, a repeated, time-consuming trying is required, followed by cautious resumptions of the work, and this method leads to expensive and, after all, not sufficiently accurate production. And an objection to customary methods which is of the greatest practical importance, arises when the work is to be passed upon by the foreman or in the testing department. Terms as tight-fit, suction fit, light running, slight play, etc., are subject to varying interpretations, causing differences of opinion and therefore dissatisfaction, and if the micrometer is used to determine a measurement in figures it should be used in the shop as well as in the testing department and, as already said, it does not give exactly the same results in different hands and is comparatively slow, while the matter of wear also plays a part. With the increasing production in series, many efforts have been made for improving the measuring methods, but most of the proposed improvements require skill which may be available in a testing department but cannot be made available throughout a large shop. In the case of scientific measuring machines, their cost in the number in which they would be required for meeting the needs, is also prohibitive.

NEW INSTRUMENT MADE IN MANY MODELS—Under these circumstances the advent in the German automobile industry of an instrument like the Hirth minimeter may be considered an event of the first rank, as in its various forms and adaptations it is handy, reliable and cheap.

The essential part of a Hirth minimeter consists of a lever with very unequal arms and working on a knife-edge fulcrum which is glass-hard and of relatively large linear dimensions, this principle of construction obviating inaccuracies such as are commonly due to friction in spindle bearings and to the yield in films of lubricating oil. The apparatus is not, strictly speaking, a measuring instrument, but a device for comparing the dimensions of a piece of work with those of a normal piece of work of the same kind to which the apparatus has been adjusted, and for permitting this comparison to be made with extreme rapidity and accuracy, and to be expressed in absolutely definite terms of measurement. In shop practice, if more than one dimension is to be measured at the same time, more than one apparatus would seem to be required.

The touch spindle A carries at its lower end a hard and easily replaceable steel ball C and at its upper end a forked knife-edge B on which rests a U-shaped cradle E carrying the hand I. And in the cradle E there is placed a second cradle F whose position is adjusted laterally by means of the screws H so as to bring the line in F against which the lower edge of the double-knife-edge piece L impinges more or less to one side of the bearing line in E against which the touch spindle impinges from below. The upper knife-edge of L rocks in the notch of the member N, which is

fixed in the operation of the device, though made adjustable for the greater convenience and cheapness in its manufacture. The whole apparatus is inclosed in a steel tube O provided with dust-proof end-covers, while a cut-out covered with a glass P permits the operator to read, on the dial Q, differences in measurement ranging from 1/100 to 1/500 part of a millimeter, the ratio of fineness in the movement of the index depending upon the adjustment of screws H.

The object to be measured is placed between a base, which takes different forms according to the shape and nature of the work, and the steel ball at the lower end of the minimeter spindle, and the instrument is always first brought into a position in which the distance from the base to the spindle ball is approximately correct, whereafter the fine measuring is done by means of a knurled nut under the base. Mr. Riesz illustrates ten different models of the instrument. The first one is intended for prismatic shapes and flat or disk-shaped pieces. A small finger lever here admits of raising the spindle while the piece to be measured is placed in position. In the model intended for measuring grooves, as, for example, the race in the disk of an end-thrust ball-bearing, the whole minimeter device may be lifted off and then put back in the measuring position again. Other models are for measuring, respectively, screw threads and steel balls, axles, bushings and pistons externally, and crankshafts and axles while they are on the lathe. Still other models, based on the principle that a circle is determined by three points of its circumference, are adapted for measurements of hollow parts.

It seems to be the working principle for all of this series of instruments, which is now in the German market, that ordinary calipers, in their usual variations, are employed by the workmen to bring each article close to the limits of accuracy required and that the minimeters are to serve only toward the end of each piece of work, when there will be no need of interfering in each case with the rough adjustment of the device.—From *Der Motorwagen*, March 10.

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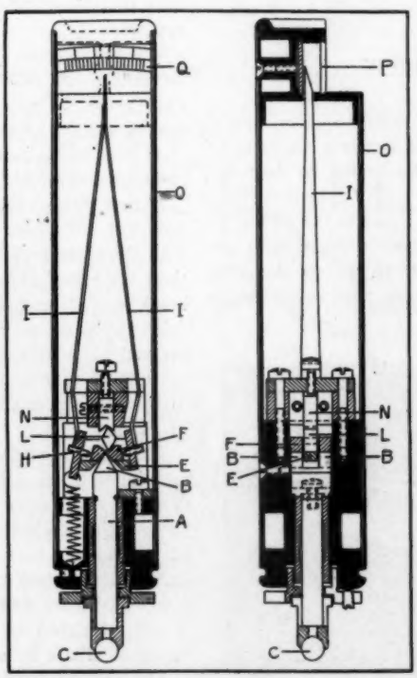
Wire Wheel Construction—Arguments for and against the wire-spoked suspension wheel continue to engage European attention. Says one authority: "The wire wheel must be perfect or not at all. It is a rigorous necessity in its construction that the initial tension of the spokes should be greatly superior to the tension to which these spokes will be subject by reason of the weight of the vehicle and its load. Unless this precaution is taken there will be a stretch-and-contraction movement in each spoke every time it passes from a work-position to a rest-position, as the wheel revolves, and its head will soon wear through its socket in the rim. In the Rudge-Whitworth, of the triple-spoke type, the initial tension varies from 526 to 720 kilograms per spoke, and twenty to twenty-five spokes support the hub at the same time, so that a large margin of security is provided at this point. The greatest obstacle which the development of the wire wheel will meet will undoubtedly be the deluge of poor wire wheels which will follow the success of the good ones. To make a wire wheel it is not sufficient to lace any kind of rim to any kind of hub with iron wire. The rim must be special—pressed cold from special material in a special machine—with certain necessary variations in the thickness of the metal; the spokes must be special and specially strung, and the hubs, too, must be special; for a hub that is too short is the greatest insecurity of all."—Mortimer Mégret in *La Pratique Automobile*, April 10.



Measuring mechanism with sight index used in Hirth minimeters

From six to eight cylinders—The moment the 6-cylinder motor has become widely accepted as representing luxury in motor power in a degree not quite attainable in the standard 4-cylinder type, the inquiring mind at once moves ahead one notch and asks: "Why, then, is not an 8-cylinder motor still more desirable?" The old objection, usually dressed in the term "the more cylinders the more trouble" evidently no longer holds good, since the "six" is accepted. It is this question which is put and answered in a recently published description of the latest type of the De Dion-Bouton 8-cylinder automobile, in which the motor is of the V type and develops only 20 horsepower, according to the customary low French valuation, the motor dimensions being 70 mm. bore by 130 mm. stroke (2 4-5 inch by 5 1-5 inch). Ignoring the possibility that the 6-cylinder motor may owe a part of its vogue to the fact that the length of the bonnet gives visible evidence of the power-luxury and that this may be appreciated by the public as a matter of fashion and prestige, the French manufacturer defends his construction on purely mechanical and economical grounds. The 8-cylinder V-motor is cheaper to build and easier to build right, it is stated, than the 6-cylinder vertical motor. It is generally admitted that 8 cylinders give a more uniform torque than 6 cylinders, while very little is gained by increasing the number beyond 8; the overlapping of the power strokes is completed by 8 cylinders, allowing that the expansion of gases covers about 90 degrees for each explosion (from the moment high pressure is reached to the opening of the exhaust.) The power luxury of 8 cylinders is therefore greater than that of 6, unless there are difficulties in making 8 cylinders work properly, difficulties with crankshafts or connecting-rods, for example, or with carburation and ignition. But the crankshaft of the 8-cylinder V-type is the ordinary 4-cylinder crankshaft, only thicker, while the 6-cylinder crankshaft is expensive to make and difficult to fortify against torsion and vibrations. With regard to compactness, while 8 cylinders fill the bonnet quite snugly crosswise, the motor is no longer than a 4-cylinder motor on one-half its power. It gives that opportunity for comfortable and spacious disposition in the carriage arrangements which it is difficult to obtain in a "six" without an over-long wheelbase. No similar advantage could be obtained with six cylinders by arranging them on the V-plan, as the angle of the V would have to be 120 degrees and this arrangement would make it impossible to get room under an ordinary bonnet, while the cylinders would also be more nearly horizontal than vertical and might be difficult to lubricate. Only the motor with 8 cylinders can therefore participate in the benefits of the V type, which are considerable. It gives rise to a very symmetrical design. The same camshaft with eight cams which serves a 4-cylinder motor serves the two groups of cylinders.

The organs of carburetion and of ignition repose in an excellent location in the lap of the V. The two carbureters mounted together, and whose air valves are controlled from the same spindle, supply each one of the two groups of cylinders. These two carbureters are supplied with gasoline from an auxiliary small gasoline tank which is mounted on the motor-side of the dashboard, and this auxiliary tank is always kept full by means of an air pump which places the main reservoir under pressure. For starting the motor, and after a filling of the main tank, the air vent of the auxiliary tank is opened, and the start is made by gravity feed, but the vent is then closed and thereafter the air pressure in the main tank does the work. —From illustrated description in *Omnia*, April 13.

Clever Temporary Repair of a Broken Spring on the Road; Oils for Various Purposes; A Record of Cheap Service from Tires; South America as an Automobile Market; Road Around Great Salt Lake

Repairing a Broken Spring

EDITOR THE AUTOMOBILE:

Experiences on the road by amateurs in the automobile world, prove sometimes to be of exceeding interest even to those who are more or less accustomed to the ever-recurring mishaps encountered. I might cite one which I think might be of assistance to those who tour through rough country.

While I was touring last summer through Pennsylvania, I happened to strike a rough piece of road on which I broke one of my rear springs. I was miles from any help. I immediately jacked up the rear frame reach, which was attached to the broken spring illustrated in Fig. 1. Then I put the spring leaves back in their natural position. This arrangement made them look almost as good as ever, but how was I to keep them there, and still hold the frame reach up, without the help of the jack? Upon perceiving a board fence at the roadside, a plan occurred to me which turned out to be my salvation.

Stripping a couple of boards from the fence, I split them up into pieces about a foot in length. Then I filled the space between the spring center and the frame reach by placing these boards one upon the other as illustrated in Fig. 2. After wrapping both ends with cord, thus making a solid block of the boards, and attaching this firmly to the car, the jack was taken out. Suffice to say, the scheme turned out a success, and after careful driving, I reached a garage, where the spring was repaired.

F. E. S.

East Orange, N. J.

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Timing of a Regal Motor

Editor THE AUTOMOBILE:

Kindly tell me how to time a Regal 1908 25-horsepower four-cylinder motor. The bore is 4 inches and the stroke 4 1-2 inches. The firing order is 1-2-4-3. I would like the timing in degrees on the crank circle.

New York City. LOUIS ULLMAN.

Intake opens 5 degrees past upper dead center and closes 40 degrees past lower dead center. Exhaust opens 40 degrees before lower dead center and closes 7 degrees past upper dead center.

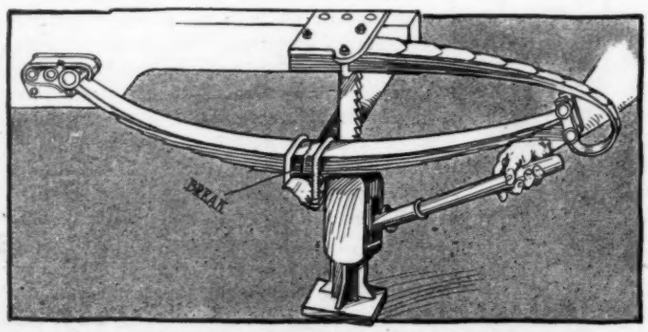

Fig. 1—First process in repairing a broken spring on the road

Oils for Different Purposes

Editor THE AUTOMOBILE:

I am driving a Packard 30 and would like to know what oil is recommended for the following parts: The gearset housing, rear universal joint, brake fittings and connections, front universal joint, magneto contact-breaker and magneto distributer. I know that practice differs in regard to the best lubricant to use for many of these purposes, but I would like to know what you recommend.

New York City. LOUIS BOURGEOTTE.

Gearset housing—Transmission oil, every 1,000 miles.
Rear Universal Joint—Graphite, every 500 miles.
Brake fittings and connections—Cylinder oil every 300 miles.
Front Universal Joint—Transmission oil, every 1,000 miles.
Contact-Breaker—Cylinder oil, every 300 miles.
Magneto distributer—Cylinder oil, every 300 miles.

These figures can be brought down to a time basis, figuring about 300 miles for a week and 1,000 miles for a month.

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Cent a Mile for Four Tires

Editor THE AUTOMOBILE:

No feature of automobile use is more nearly personal to each owner and user than the endurance of pneumatic tires. We hear of cars that have run 10,000 miles on one set of tires, and we see tires that have failed to make 2,000 miles without very extensive repairs.

We are offered "superior" casings at $40 apiece, and we see advertised the same casing with the name buffed off at one-half that price. These seemingly paradoxical conditions prompted the writer to extensive tests in order to determine in a practical way how much real service could be obtained from a very common casing.

A new first-grade casing blew out from a stone bruise after only 630 miles use. It was sent to the repairer and was returned with the assurance that it was now as sound as when new. Less than 200 miles' use brought bulging at the location of the former break, and it as again returned to be vulcanized. Five layers of fabric were placed on the inside over the weak part and it surely seemed very strong, but a little over 300 miles' use caused it to again give way and the old casing was thrown aside. The life of that casing was less than 1,000 miles, including over $5 worth of repairs.

The failure of this casing to hold resulted in the loss of two new inner tubes, valued at $10, making the total expense of that tire for 1,000 miles $55. This expense applied to the car in the same ratio would give a tire expense of 22 cents for every mile of use.

A popular steel rivet tread leather protector was then placed upon a similar new tire casing, and a half-price second-grade casing, prepared as I am about to describe, was placed upon the opposite wheel in order to compare results.

The cast-off casing, a Dunlop style, was thoroughly cleaned and one of the wired edges was cut off about 3-4 inch wide.

This old casing was then crowded over the deflated second-grade casing so as to surround the axle between the wheels and the frame, with the cut edge outward. With a large crew-driver I then pried the old casing over the new second-grade one, bringing the cut edge about 1 inch from the lock ring of the quick-detachable rim. I then punched holes about 3-16 inch in size with a harnessmaker's buckle punch about 3-4 inch in from the cut edge of the old casing and opposite each one of the twelve spokes. Into these holes, from within outward, I placed ordinary belt hooks, 2 inches long, and closed the hooks down onto the rubber. A piece of No. 8 galvanized iron wire was then run around the wheel in the free ends of the belt hooks, and the ends of the wire bent into loops so that they would be about 6 inches apart. The free ends of the belt hooks were then bent shut over the wire, and a small rawhide strap 14 inches long used to hold the loop ends of the wire on a slight tension. The tire was then pumped up to 65 pounds pressure and the old casing on the outside of the new second-grade one of the same size was held so snugly against it that water or even dust could not get between them. This tire as thus provided with an old casing as a protector has run without a change of inner tube for 1,068 miles, and is still in good running order, although the protector is worn down to and in some places partly through the fabric.

The leather tread on the opposite wheel lasted for a little over 6,000 miles, and then was so badly worn that it was thrown away.

Once only a nail passed through both casings and inner tube, requiring repairs. The casings were not removed from the wheel, but after removing the lock rings and pulling the casing edge beyond the edge of the rim, the tube was pulled out and patched and returned to its place, the protector casing remaining.

The cost of this second-grade casing and a high-grade inner tube was $25.65. At this ratio the expense for tires for this car for over 10,000 miles use would be a little over $100, or practically just 1 cent a mile for the entire four tires.

Marshall, Minn. A. D. Hard.

South America a Good Market

Editor The Automobile:

There are many striking illustrations of the fact that the world is growing smaller. It is due not so much to the shrinking process, which is always going on as the interior continues to cool, but to the bringing into closer contact and relationship of one country with another.

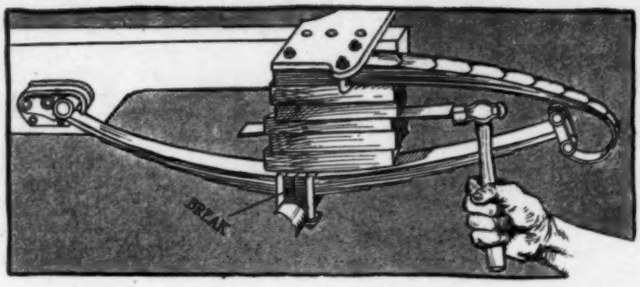

Fig. 2—Wedging in the blocks, after which they were wrapped with cord

But a few years ago to go to another country was almost the equivalent of going to another world. The railroad, the steamship, the telegraph and the telephone have been great distance eliminators.

As I journey through these far-off South American countries there are evidences on every hand that good old Uncle Sam's country is not far away. The cash register, the harvesting and threshing machine, and innumerable other lines of products from distant countries are everywhere in evidence.

American-made automobiles are beginning to become numerous and I have met them very frequently in the various countries. The dealers say that there is already a strong demand for them and that it looks as though the market for them will be much greater before long. It occurred to me that your readers might be interested in this phase of the conditions prevailing in the countries of South America.

Rio de Janiero, Brazil. H. S. Smedley.

Good Road Around Salt Lake

Editor The Automobile:

Owing to the fact that all the accounts of transcontinental trips have branded the roads around the north end of Great Salt Lake as bad, many inquiries have been received from the East as to the road conditions in Utah. These accounts have by no means been overdrawn, but there is, however, a good mountain road, now well marked by large signs, a few miles farther north. I inclose a map of the region with the better route clearly marked (Fig. 3).

Ogden, Utah. O. J. Stillwell.

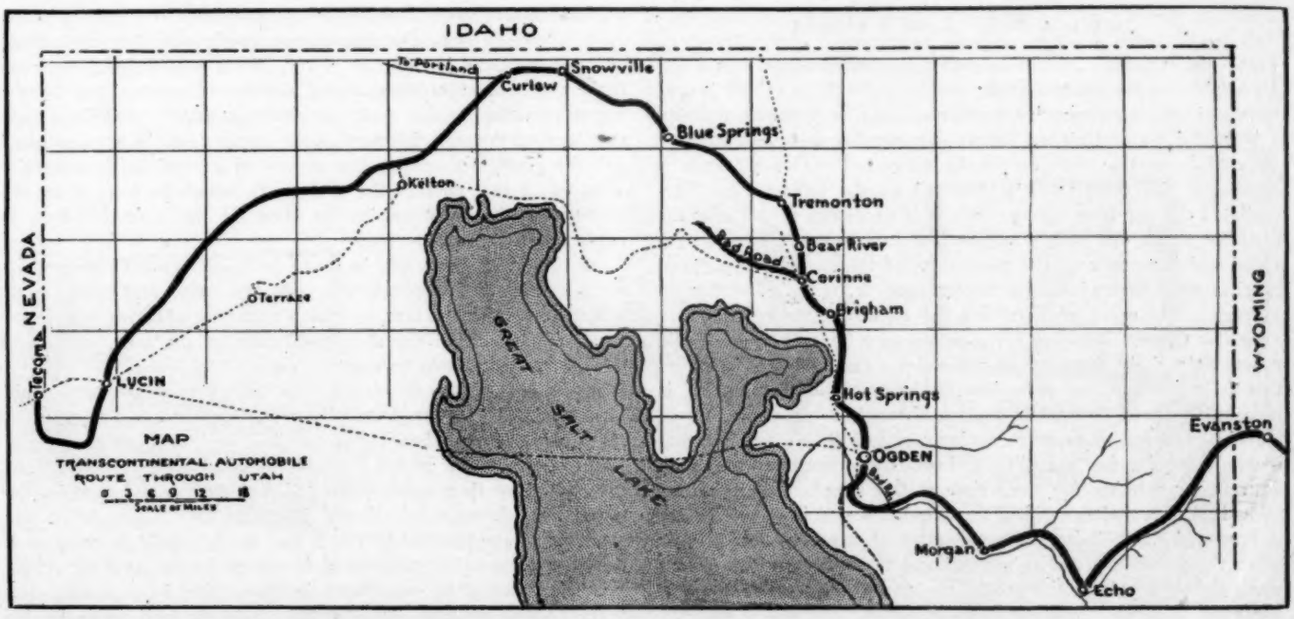

Fig. 3—Map showing a good mountain road around the north end of the Great Salt Lake in Utah

Making Preparations for a Week's Tour

Deciding on Where to Go, and When; Planning Routes; Tuning Up the Car; Selecting and Stowing Equipment and Baggage; Importance of Carrying as Little as Possible; Minimizing Road Troubles

SPRING fever and wanderlust, which might after all be the same malady, hold full sway at this season of the year. The idea of lolling luxuriously in the upholstered seat of an automobile and watching the hills and dales of a verdant country stretch themselves in an ever-changing landscape before the eyes, appeals strongly to those who can spare the time from the duties of everyday life. But let the intending tourist amply prepare both the car and himself for the trip, lest these hopes of a period of unmitigated joy be rudely shattered.

The first thought that will spring up in the mind of the prospective tourist will naturally be in regard to what part of the country he is going to tour. Starting from any of the large cities, the tourist will have little difficulty in selecting a route that will lie through a country of beauty. It is assumed that the tour is not being made for the sake of mileage, but for the enjoyment of scenery attractive for its beauty or historic interest. The first consideration must be the roads. The choicest bits of scenery fail to awaken the slightest trace of appreciation among the members of a party which is being jounced about in the car and thrown from side to side by the inequalities of the road. Many avenues of information are open to the prospective tourist regarding the conditions of the roads and the distances between points of interest. If he is a member of a club, there will be maps and complete data at his disposal. Friends have often made tours which have left such delightful memories that they are glad to furnish directions regarding the routes and the equipment which should be taken along. Road maps are cheap and are for sale everywhere, so that mapping out the trip presents little difficulty if a few of the ordinary common-sense rules are remembered.

Surprises Make Tour a Delight

In the first place, it would be well to remember that it is undesirable to retrace the route on the return trip. The joy of touring is the unexpected. To turn a bend in the road and find a beautiful vista stretched before the eye, brings a sensation of delightful surprise that cannot be surpassed. This pleasure is missing if the same route is pursued on the return trip. Secondly, if the trip is to take a week, it is necessary to consider the distance which can be covered in that time without exceeding a speed which permits of the enjoyment of the tour. Experienced tourists who have given the matter deep thought figure that an average of 17 miles an hour for the running time represents a very fair figure. Running for a period of 7 hours per day would represent a daily distance of 119 miles. On first consideration this daily average may seem low to the ambitious tourist, but if it is remembered that while passing through a town the rate of travel would fall to 12 miles an hour or less it will be seen that it would require fast traveling to bring the average up to a high figure after running for some time at this speed. A trip of 700 miles in 6 days makes an ideal tour, and if a circuit of this length is arranged through interesting country at a period of the year when the weather is apt to be good and there is very little repair work going on along the roads, the trip should prove a great success.

After having decided the route by means of a road map and a scale of miles, the more definite part of the itinerary should be settled. Bearing in mind the approximate distance to be traveled per day, the night stops can be settled upon. These, of course, will not be at regular distances apart, but in most parts of the country it will be found that they can be arranged so that they fall within the limits which may be set for a day's travel. When they are not, the tourist is traveling in the less populated parts of the country and he will have the option of doing a little night work or of including in his equipment a tent which he can pitch in some convenient spot and thus spend the night in camp. The number of evenings in camp will depend altogether on the nature of the country which is traversed. As a general rule, however, the night stops will be at hotels, and we will assume that this is the intention of the prospective tourist. On a tour of this kind it is not always possible to secure adjoining or even neighboring rooms in the hotels unless reservations have been made in advance. Whenever possible, the tourist should make his reservations at least a day or two before he expects to arrive at a hotel, especially during the summer touring season and on popular routes, as otherwise severe discomforts may be met which will seem the more irksome because they might have been so easily avoided.

Weather Should Be Considered

When the route is fully decided, both as regards stops en route and the roads to be taken, the season of the year is the next factor to be taken into consideration. Last year's Glidden Tour certainly pointed out a lesson in this respect if in no other. There are times of the year when rain can be expected in many localities and it very seldom fails to appear. It is generally on time and very often considerably ahead of time. Smiling skies and a bright sun may delude the automobilist into the belief that the bad weather will hold off for some time, but these evidences are as naught compared to the weather records of the past 10 years. This is especially so throughout the South, where in the spring and fall traveling is generally a very moist proposition. Between these two seasons an occasional thunder shower would be the worst that the tourist could legitimately expect, and it is then that touring through this part of the country can be accomplished wih the greatest success. The tourist of a week being generally a native of that part of the country in which he is to tour will know best the most seasonable time of the year for him to carry out his plan.

All these directions will be more or less covered by the tourist himself while he is pondering over his route and the time at which he can best expect to take a vacation. Having completed what may be called the theoretical part of the tour, the actual work of getting ready to start follows:

Two weeks before the day set for departure the owner should start to get his car tuned up. It will not be necessary to give the car a thorough overhauling if this has been done at the beginning of the season. If not, however, it should be done now. The car should be thoroughly inspected and wear which can be detected in different parts should be taken up. There is no use dwelling on the manner in which this work should be done as it has been thoroughly considered in recent issues of THE AUTOMOBILE. It might be mentioned, however, that loose spring clips cause broken springs. The owner would do well to paste this warning in his hat while the car is on the road, especially if his

car is new, as experiences with broken springs are not pleasant.

When the car has been put in condition and the time of departure has drawn so near that the question of equipment, both personal and for the car, has become uppermost in the minds of those who are to make the trip, the real business of the tour may be said to have commenced. A full tool kit should be the first consideration. Besides the tools which are supplied with the regular first-class kit, such as S wrenches, Stillson, monkey wrench, screw-drivers, files, pliers, cotter-pin remover, hammer, etc., several extra pieces should go into the emergency kit. These include chalk, an extra jack, 5 feet of leather lacing, a roll of tire tape, some short lengths of wire of assorted sizes, collapsible waterbucket, box of assorted cotter-pins, extra spark-plugs, 20 feet of hemp rope, jack-knife, hacksaw, gasoline funnel, tire repair kit, sandpaper, and a good-sized piece of waste. These tools and conveniences should be so arranged that those which are most apt to be used are nearest the top in order that time will be saved when they are required.

Many Extras Should Be Carried

Outside of the tools themselves there are many things which should be carried as spare equipment on a trip of this kind. Extra tires will, of course, be necessary. At least two extra shoes should be taken on the trip if the tires are the same on both the front and rear wheels. If the tires on the rear wheels are larger than those on the front, two rear shoes and one front shoe should be carried. About ten inner tubes should be carried, each one kept flat and amply powdered with soapstone so that when they are required for use they will be in good condition and will not fail when they are needed. These tubes should be repaired as the tourist travels. Each evening, after the day's run, the tubes which have been punctured during the day can be repaired so that a full supply of reliable inner tubes is kept constantly on hand. Another tire accessory which will prove its worth in an emergency is an air bottle. In case of a puncture during a rain storm, anything which lends speed to the operation of changing the inner tube is exceedingly welcome. A threatening thunder shower will also cause the tourist to hasten his tube-changing operation as much as possible. Another useful accessory on a tour is a half-pound bag of powdered flaxseed. This is not for the purpose of making poultices, but for temporary radiator repairs. In case of a radiator leak the flaxseed is poured through the radiator filler-hole. It will do no harm to the motor nor the circulating system while, owing to its tendency to swell under the action of hot water, it will stop a small leak until the car can be taken to a garage where a permanent repair can be made. All these are necessities on the trip and will be found in the kit of the experienced tourist before he makes his start.

A word more may be said about the equipment of the car. If it has been lying in the car since last season, it would be well to take it out and inspect each part of it. The tire pump must be tried out if it has not been used for some time. If he is a city man, the car owner may have been supplied with air at his garage and on that account his pump may not have been used for a long time. It is inconvenient to be forced to repair the plunger of a pump on the road. A little touch of oil on the tools here and there will keep them from rust. A very good plan is to wrap those which are not frequently used and which are susceptible to the inroads of moisture in a soft, woolen cloth thoroughly moistened with oil.

Some Ways of Stowing Equipment

Where to put the equipment is the next consideration, and it is one of extreme importance. The first rule to remember is to keep bulky packages out of the tonneau. The second is to keep tools which are apt to be used frequently away from the rear seats unless the party is entirely of the stag variety. It must be conceded that it is extremely easy to carry the jack, tire-irons and similar tools beneath the tonneau seats, but this is more than counterbalanced by the discomforts accruing to those who are forced to dismount from the car in the rain or on a bad stretch of road while the tire is being repaired. The space beneath the seats should be utilized solely for the emergency equipment, such as the 20-foot length of rope, which is very essential, and such tools as are not apt to be necessary except in case of ditching or other mishap. A very good place to carry the jack, if there is no provision for it in the toolbox as on some of the larger cars, is flat against the front seat. Two small brass staples may be screwed against the front of the seat and the jack is held in position by means of a strap run through the staples. In this way the jack is always ready for use. The tool box on the running-board will hold all the other tools that are necessary for quick repairs. One exception may be made, however, regarding the tools in the running-board box. That is a small pair of pliers, which should be kept in the pocket or in some other easily accessible place. These are required for so many little operations about the car that time is saved by having them where they can be secured in a few seconds without going through the trouble of unstrapping or unlocking a tool case.

Personal equipment is the last point to be considered before the start. This department of the tour generally causes the most trouble when it should give the least. One of the paradoxical features of personal equipment is the fact that those who are the most experienced carry the least. The old backwoodsman smiles derisively when the city camper arrives with forty-five complete changes of costume and in like manner the experienced tourist regards the car laden down with a pile of useless impedimenta. Instead of finding useful articles which the tourist resolves to take along with him on his next trip, the contrary is the case. Each trip, until the personal equipment is reduced to a minimum, it is found that some article which seemed

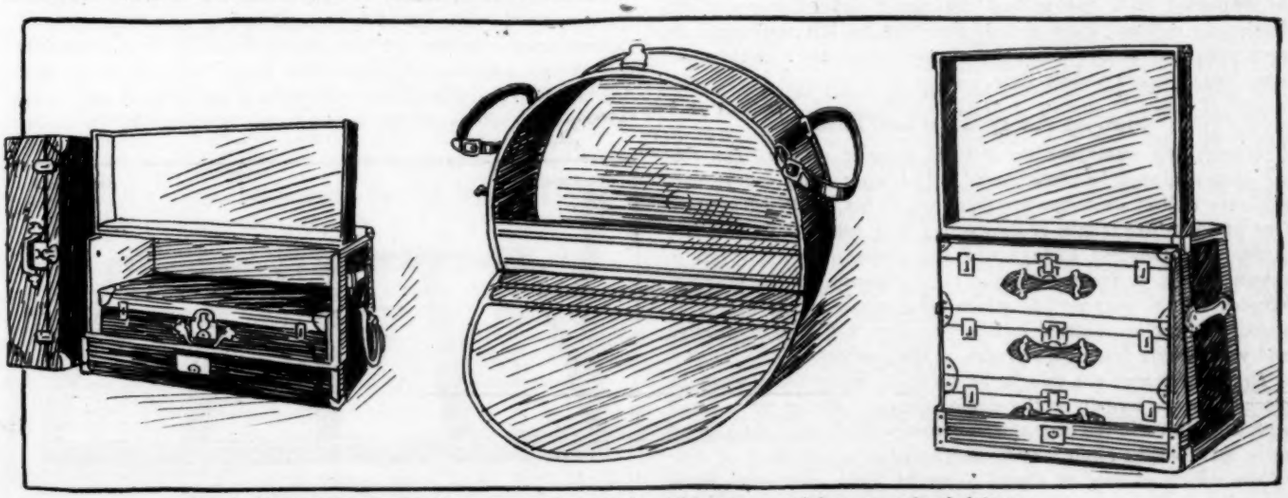

Fig. 1—Modern forms of suit case and tire trunk which prove useful on an extended tour

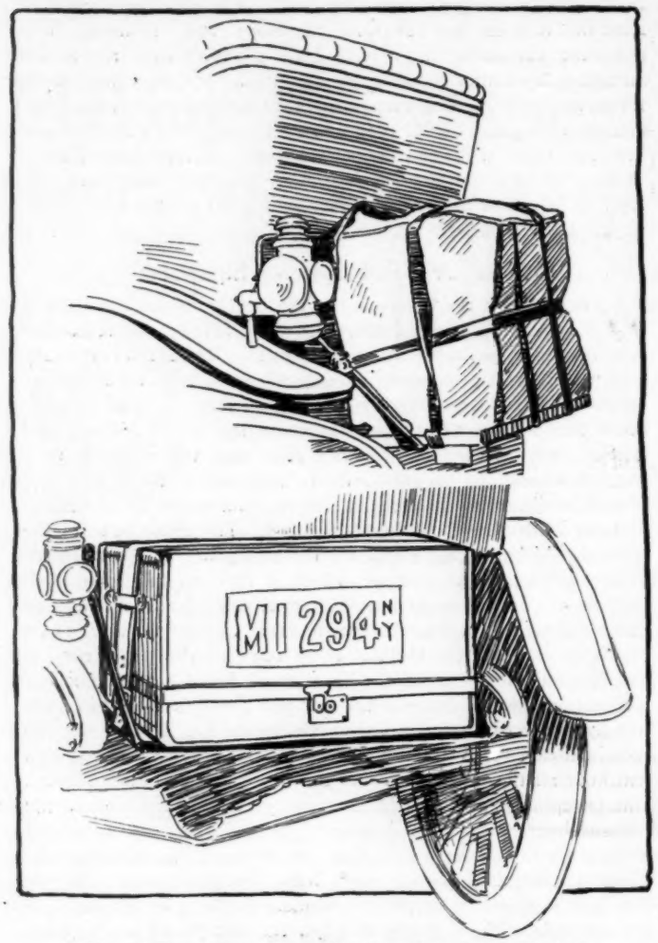

Fig. 2—Two ways of carrying baggage; bad and good

important at first can be dispensed with. One suit-case to each member of the party is sufficient, with the possible exception of a small handbag or satchel to accommodate the little necessities so dear to the hearts of the ladies.

Assuming that our party consists of four people, two men and two women, all the personal baggage would be carried in four suit-cases and a small satchel. As the satchel does not take much room it may be placed anywhere in the tonneau. The suit-cases, tire casings and tubes remain to be packed on the car. The tires should be put on the car first, the best way to carry the casings being in a waterproof, button cover. These are generally made of enameled duck and protect the casing against the weather. Under no circumstances should the tires be left uncovered as such exposure impairs the rubber to such an extent that they will wear out in a very short time.

Stowing Away Tires and Tubes

Sunlight and water are the natural enemies of tires and this should always be remembered. The inner tubes can be carried very well in a circular tire trunk which fits inside the casings. One of these tire trunks is shown in Fig. 1, while the whole tire outfit, with the two casings and the trunk of inner tubes is shown in Fig. 4, fastened to the car by means of the brackets adapted for the purpose and which are for sale at any accessory shop. If tires are carried in this way they will give no trouble and will be safe from the ravages of the weather.

Those suit-cases are still to be packed. Where they shall be placed depends largely on the size of the car. If the car is fitted with a trunk rack, the proposition becomes very easy. At a small price, a trunk-like affair may be purchased in which three or four of the suit-cases may be placed. One of these, containing three suit-cases, is shown, with the cover lifted, in Fig. 1, while another with one of the cases removed is shown in the same illustration. When these trunks are fitted to the car as depicted in the lower part of Fig. 2, they are very neat and compact and leave nothing in the way of the occupants of the tonneau. In the same illustration is shown the clumsy job that will result from putting a waterproof covering over the suit-cases and strapping them to the trunk rack. The time required to withdraw one of the suit-cases and refasten the waterproof cover is treble that required for withdrawing one of the suit-cases from the trunk. The racks which carry the trunk are not expensive, as a rack of any size may be bought for $1.50. A very good form of rack which has been brought out lately is shown in Fig. 3. If no trunk rack is fitted it will be necessary to store the suit-cases in the tonneau or on the running-board.

Keep the Running-Board Free

A rig recently seen on a car starting for a long tour through a country that was rough, to say the least, is shown in Fig. 4. No comment on this is necessary. Aside from its appearance, the first hard rain that was encountered would produce a very sad result. If suit-cases aside from those on the trunk rack must be carried, they may be put on the running-board, although, if only for the sake of appearance, it is best to keep the running-board free. When putting the suit-cases on the running-board, individual button slip covers of duck or other waterproof material should be put over each. In this way any one may be withdrawn. In a car with a fairly large tonneau three suit-cases may be readily carried against the back of the front seat. The foot rail will aid in the support of the cases, the bottom of the case being between the foot rail and the back of the front seat, while a strap placed around the cases through the handles, which are toward the rear, will hold them tightly. As regards the trunk often used, in which baggage is placed directly in the trunk, it has the difficulty that when putting up at a hotel and the different members of the party are in different rooms, several trips between the rooms will be necessary to distribute the baggage.

The coats, which are an essential part of the clothing equipment, can always be kept in the tonneau. No harm will befall them there and they will be handy for use at a moment's notice. Sweaters are also necessary in the spring or fall. Even in the summer, if some of the stops are far between, sweaters will give a welcome warmth in the coolness of the evening. These can be carried in the tonneau if there is no room in the suit-case, without inconveniencing the occupants. Suitable gloves and goggles will, of course, be carried. In the suit-cases will be the personal effects of the tourists. If all goes well a change of outer clothing will not be necessary on the trip. Underwear and toilet articles are all that is required. If the party expects to attend a fancy dress ball at one place and another entertainment at the next stop, it would be better to express the baggage ahead. Under such circumstances the trip would not be a real tour, and the automobile ride would be forced into a secondary place.

Emergency equipment, while not necessary, is a very comfortable thing to have on a trip of this nature. A gallon of gasoline in one of the auxiliary cans which are sold at the supply houses especially for this purpose will often prove its utility.

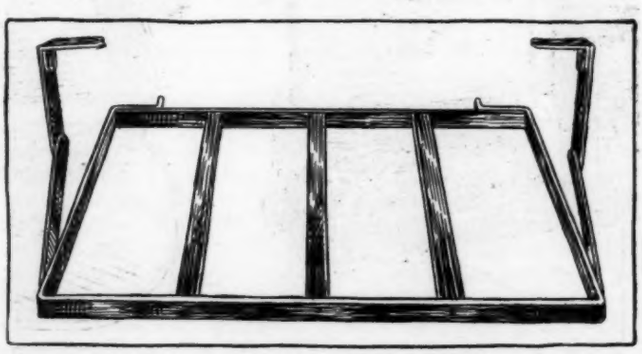

Fig. 3—Form of trunk rack in general use

Without one of these a gasoline leak which might not be discovered until the car stopped short would be a serious thing. When the mergency tank is on the car, the leak may be patched up temporarily with a small piece of tire tape, the spare gasoline poured into the tank and the car may be driven to a place where the supply can be renewed. This spare tank is not large and can be strapped somewhere where it will be out of the way and at the same time will not give a bad appearance to the car. A kerosene oil can forms a handy auxiliary supply tank and it can readily be fastened by means of a strap passed around it. An extra gallon or two of lubricating oil should also be taken along. In the summer, while the oil is running very freely, the level in the reservoir is apt to drop more quickly than at any other time. One oil concern makes a practice of supplying its patrons with brackets which can be readily affixed to the running-boards of the car. These are affixed alongside of the tool box, as shown in Fig. 4. They are neat in appearance and hold the can of oil securely.

Be Prepared for Accidents

A first aid kit, consisting of bandages, peroxide, sugeon's scissors, adhesive tape, cord, Newskin or some similar material, cold cream and healing salve, should always be taken along. Leather cases are sold which are adapted especially for these kits. This kit may seldom, if ever, be used, but when required the tourist will be thankful that he took it along. At least one vacuum bottle should be taken on the trip. Two are better, one being reserved for hot drinks, while the other is suitable for cold. Other articles which should not be overlooked in the emergency equipment are the tire chains, a waterproof cover, folding aluminum drinking tumblers, electric flash lamp, rubber spring bumpers, radiator mud aprons, leather straps, rebound straps, a volt-ammeter, tire pressure gauge, small oil-stone and a couple of blow-out patches.

With these precautions and the outfit described, the tour should proceed smoothly. As regards travel, a word of advice may be given. Start as early as possible. A stag touring party may get away at 5 o'clock in the morning, but anything like that can never be hoped for when ladies accompany the tour and the pleasure of their company must be paid for by a little less time on the road. It will be found, however, a good rule to start early and to arrive at the resting place early in the day, anywhere from 3 o'clock in the afternoon on being a good hour in the country where a short stay would be a delight and not a delay. Very often a game of golf before twilight on a summer evening or a stroll about a spot of historic or scenic interest forms a delightful variation in the program of the tour. The secret of the success of the tour through whatever country it may be made lies primarily in careful preparation.

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IRELAND levies no tax on conveyances. Many Irish motorists contend that until the portion of the Act of Union relating to conveyance of taxes is repealed they need not pay revenue taxes on their cars. The Automobile Association and Motor Union has had this matter under consideration for some time past and its officials hope to issue a statement thereon shortly.

USEFUL TOURING ACCESSORIES AND THEIR COST

Article	Price
Pocket flash lamp	$1.00
Blow-out patches	.80 — $1.75
Tire pressure gauge	1.45 — 3.00
Air bottle	9.50
Tire casing holders (each)	1.50
Extra jack	.65 — 2.00
Spark plugs	.50 — *1.50
Suit case trunk	16.00 — 50.00
Tire trunk	5.00
Thermos bottles (quart)	5.00
Rubber spring bumpers (each)	.75
30 feet 1-2-inch rope	.75
Tool kit (complete)	6.00
Box assorted cotter pins	.10
First aid kit	2.00
Collapsible water pail	.40

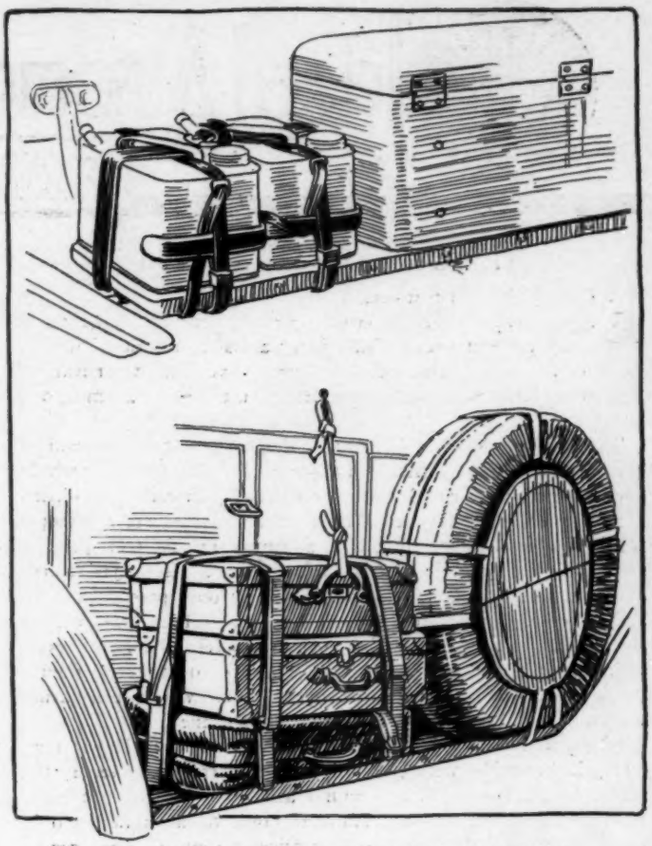


Fig. 4—A neat looking running board and another

Harking Back a Decade

FROM *The Motor Review*, May 1, 1902:

The first outdoor event of the season took place Saturday when the 100-mile endurance run of the Long Island Automobile Club was held. A circuitous course from Jamaica to Massapequa and Oyster Bay was laid out. There were eighty-two entries including gasoline, electric and steam automobiles. The fastest unofficial time made was by a 12-horsepower Panhard entered and driven by J. Grant Lyman in 4:02:30, or an average of about 25 miles an hour. The speed limit was fixed at 15 miles an hour.

The publishing business formerly conducted by Emil Grossman & Brother has been incorporated under the name of The Class Journal Company with the following officers: H. M. Swetland, president and general manager; Emil Grossman, vice-president; F. L. Swetland, treasurer.—*Editorial announcement.*

A very bad precedent has been set by some of the contestants in the recent run of the Long Island Automobile Club. The club specified 15 miles an hour as the limit for the contest and still a number of the entrants made as high as 35 miles an hour and some of them covered the whole course at from 20 to 25 miles an hour, thus breaking not only the club regulation but also the state law which provides for a maximum of 20 miles an hour in the open country.—*Editorial.*

The fall of the Waverley electric from the incline at the Indianapolis show has been made the subject of a suit by the Indianapolis agent for the Pierce bicycle. The automobile fell into the Pierce exhibit, demolishing several bicycles.

Henry Winthrop, chairman of the Law Committee of the A. C. A., who was arrested for speeding, secured a stay of proceedings in court when he testified that upon being warned by a policeman, he pulled out his watch and timed the car as it passed the telegraph poles. He said that the car passed the poles at 5-second intervals, thus indicating a lower speed than 8 miles an hour.

The Ideal Automobile for 1913

Some of Our Readers' Conceptions of What Next Year's Car Should Be

This Car to Be a Real Ideal

EDITOR THE AUTOMOBILE:

I herewith beg to outline an ideal car for a person in my circumstances. This ideal car is a limousine with a capacity for seven passengers; because I have lots of friends in this great town and I believe in letting them share in my good times.

The motor is to be a six-cylinder design, 5 by 7 inches, water-cooled, and equipped with a two-point firing system. I would specify a Claudel carbureter, forced-feed lubrication, a silent-chain driven fan, and vanes in the flywheel. Of course, the motor would have to be perfectly silent, and must remain so if given a reasonable amount of care. I would desire a Hele-Shaw clutch and a Maudslay chain transmission, giving four speeds forward and reverse. Cardan drive should actuate the rear wheels through a floating axle. Two sets of brakes should be used, acting on the transmission. The wheelbase of the car should be 140 inches, with a tread of 64 inches, dual wire wheels being used all around, while tires should be 36 by 5 inches.

Suspension should be by four elliptic springs, 46 inches long and 3 inches wide, with eight leaves in the front and ten in the rear. In addition to this I would ask for a set of Truffault-Hartford shock-absorbers. Another point of advantage would lie in the use of the Ideal seat described in one of your recent issues. The body should be so designed as to give a great measure of comfort, both when riding and when at rest.

A modern business man needs must spend so much of his time away from his home city that it is a pity if he has to miss, during that time, the agreeable comfort that would surround him there. In combination with this feature there should be the possibility of great speed and easy riding; hence the powerful motor and the superior type of suspension used. A long wheelbase adds to capacity as well as to the desirable kinetic qualities, and a proportionate tread is naturally brought in by a desire for harmonic design.

To come to the final question of price, I think that it would be possible to construct my ideal car for $7,000.

New York City. JOHN HENRY JONES.

Says Knight Motor Is Efficient

Editor THE AUTOMOBILE:

Following the example of some of your subscribers, I am sending you my conception of an ideal automobile, hoping that it may prove of interest to your readers. Most of the features embodied in this machine are not theories, but practical results attained through years of experience with the various types of automobile construction.

The motor should be of the six-cylinder poppet-valve type with the conventional T-shaped cylinders cast in pairs, although if I were looking for efficiency as against reliability and durability, I should choose the Silent Knight motor, which is, when new, doubtless the most efficient of automobile engines. It should have a bore of 5 1-4 inches and a stroke of 5 or 5 1-4 inches, although I must admit that the long stroke is an excellent idea.

A circulating, constant-level splash system of lubrication has proven to be the simplest and best.

A positive centrifugal pump and honeycomb radiator should be used in the cooling system.

The ignition should consist of a Mea magneto with spark-plugs over the intake valves and a single coil and distributor with plugs over the exhaust valve.

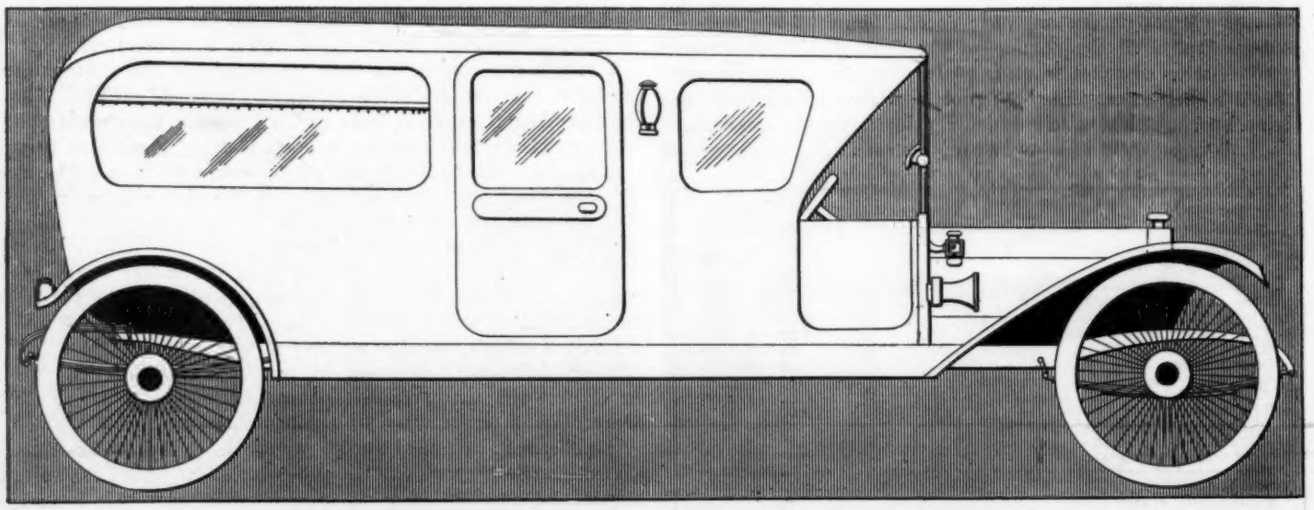
An electric self-starter, such as the Aplco, should be used; this should furnish current for the lights, Klaxon horn and auxiliary ignition system.

The clutch should be of the multiple disk type running in oil, and the transmission of the conventional four-speed selective construction, direct on fourth.

The rear axle should be of the full-floating, worm-gear type with torsion tube and yoke with single universal joint. The frame should be underslung with semi-elliptic springs of good length. Wheels fitted with Dayton airless tires of a sufficient diameter to afford a clearance of 15 inches would answer best. Wheelbase on a car of this size should be between 138 and 144 inches, depending entirely on its use.

Left-hand control with levers in center and worm and nut steering gear should be used.

Matteawan, N. Y. CHARLES L. MEYER.



A palace on wire wheels is this closed-car conception of John Henry Jones

Reason for Noisy Gears

Inaccuracies of Manufacture Cause Clashing Unless Gear is Reassembled in Its Original Meshing

A CERTAIN four-cylinder car which was usually silent developed an objectionable and mysterious noise in the differential case. The car was placed in the repairman's hands, owing to the fracture of the short spindle connecting the rear universal joint to the bevel pinion. After the differential case was dismantled and the pinion removed, the broken spindle was replaced by a new one of exactly the same dimensions and of carefully selected material. The work was carried out under competent supervision, and no fault was to be found either in the machining or the fitting of the parts. The gears were silent enough on first and second; on third and fourth the noise and vibrations in the differential case became very marked. After considerable time had been spent in a vain effort to put the matter right, it was found that by putting into mesh two particular teeth the drive recovered its usual quietness and smoothness.

The investigation of this particular case led to the following considerations, which, if not new, at least are not sufficiently appreciated by engineers responsible for the design and selection of the gears for an automobile.

On the car in question the bevel pinion and wheel have 20 and 60 teeth respectively. The ratio being an integral number, namely 3, we can say that the number of teeth of the wheel is a multiple of that of the pinion. This case is diagrammatically reproduced in Fig. 1, where, however, for simplicity's sake, the number of teeth has been reduced to 8 and 32 for pinion and wheel respectively. It is quite obvious that the actual number of teeth is of no consequence provided the number of teeth of the wheel be a multiple of that of the pinion, as stated before.

Same Teeth Engage Continuously

In Fig. 1, we assume the two gears to be in mesh in such a way that tooth 1 of A is in contact with tooth 1 of B. When this system of gears rotates, the tooth 1 of A will successively come in contact with teeth 9, 17, 25 and—provided the rotation be extended to a completed revolution—with tooth 1 again of wheel B. As long as the system rotates, the contact of tooth 1 of A with the teeth of the wheel will invariably take place in the order just stated. The same remark obviously applies to any tooth of A. For instance, tooth 2 of A will only come in mesh with teeth 10, 18, 26 and 2 of B; tooth 3 of A with teeth 11, 19, 27 and 3, and so forth. It will be seen, therefore, that for the case represented in Fig. 1 each tooth of the pinion meshes only with four particular teeth of the wheel without ever coming in contact with any other tooth of the same. That is to say, if the number of teeth of the larger wheel is N, this number being a multiple of the number n of teeth of the pinion, any tooth of the latter will only mesh with N/n teeth of the wheel without making contact with the others. Under these circumstances it is tolerably clear that if any inaccuracy exists in the profile of one of the teeth of the pinion the shape of the corresponding set of teeth of the wheel will mould itself accordingly after a certain period of running, especially if this grinding process is accelerated—as it often is—by running the gears in a mixture of oil and fine emery powder. This method of curing a faulty gearing can hardly be recommended, for the gears can only run satisfactorily if the original meshing under which the gears were "worked in" is maintained.

To make this point quite clear, assume the system of gears in Fig. 1 has taken apart and re-assembled in such a way that tooth 1 of B now meshes with tooth 2 of A instead of tooth 1 as was formerly the case. This tooth 2 of A will then have to work with that set of teeth of B which corresponds to tooth 1. A similar occurrence will take place with the remaining teeth of A so that the whole meshing is upset and the grinding or working in process must be gone through once more.

This was exactly what happened with the car referred to, and of all the parts of a car the one most likely to give trouble in this respect is undoubtedly the bevel drive on the live axle. On the differential itself a crown wheel with a number of teeth multiples of the satellites will not have the same consequences, the wheel being simultaneously in mesh with several pinions and the motion of the gears comparatively small. Gearboxes with wheels always in mesh are still very scarce and consequently do not call for special consideration. With the ordinary type of gearbox, when sliding one gear mesh with the other the contact does not necessarily always occur between two particular teeth, and as the process of changing speed is often repeated, it is only natural to infer that within a comparatively short time all the teeth of the smaller wheel will have meshed with those of the larger, thus equalizing the profile of the teeth and ensuring uniform wear.—A. Cattaneo in *The Motor Trader*.

Birmingham's Rubber Slaves

BIRMINGHAM, ENGLAND, April 20—Public attention is being called to the "rubber slaves," as the girls are called who work in the inner-tube factories of that city. Girls receive the tubes which need joining up, for the purpose of putting on an extra piece for strengthening at the valves, etc. A mixture of chloride of sulphur and bisulphide of carbon is required. This produces a volatile liquid known in the trade as "cold cure." The tubes are joined up and the patches put in with the liquid, which, evaporating, forms a naphtha gas. Its effect on the girls at work is that of a kind of intoxication which turns them into furies. This is followed by a state of coma, causing the girls to fall prostrate, moaning and crying for fresh air. They shortly recover and return to work. For all of this, they receive the munificent sum of 11 1-2 cents for joining and finishing 100 tubes. For putting on a wrong-sized valve patch, or putting a patch on in a wrong place, a fine of 2 cents is levied. If a tube has to be rejected on account of a twist in it, the girl must pay a fine of 6 cents. Philanthropists are looking into the conditions under which these girls are working.

THE DANGER into which the occupants of an automobile are liable to be placed in the event of the driver becoming seriously ill while at the wheel has caused the demand to be raised that no man shall be granted a license to drive a car until a reliable physician has issued a certificate to the effect that the chauffeur's heart is sound.

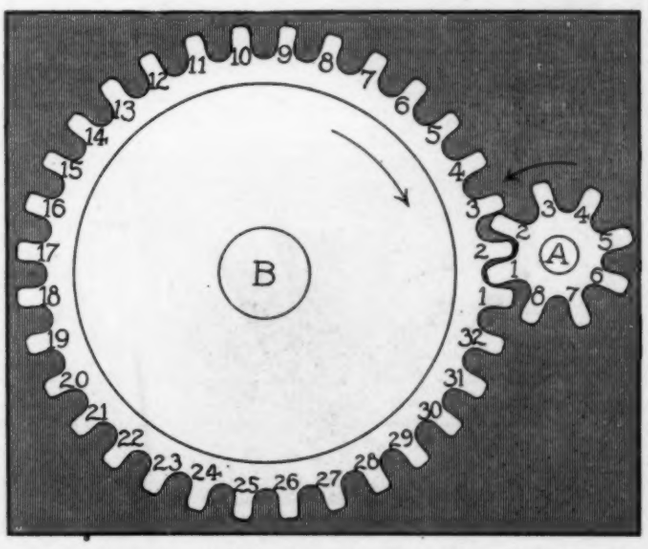


Fig. 1—Diagram to aid in explanation of cause of noisy gears

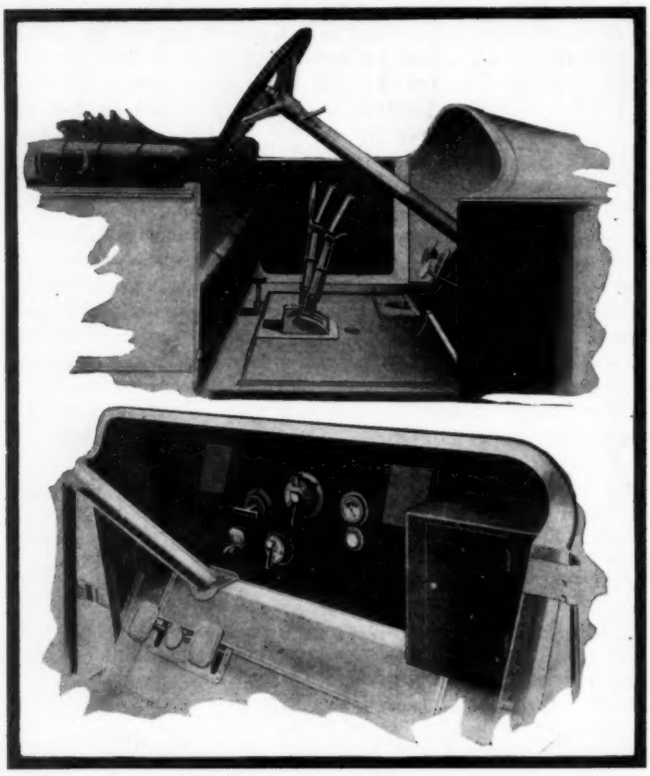


Fig. 1—(Upper)—Showing center control and left-side drive of National. (Lower)—Showing dash equipment and control pedals

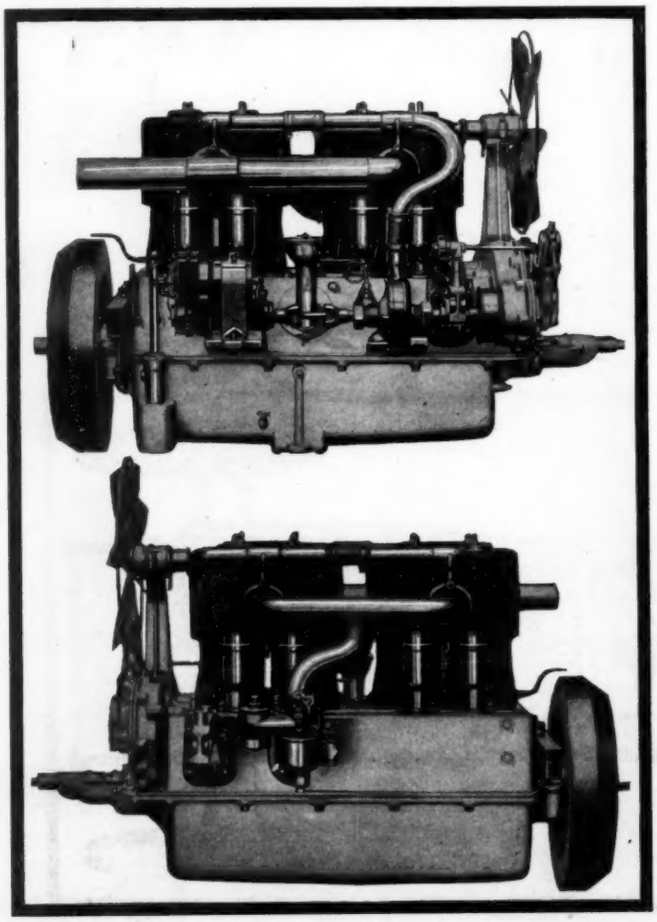


Fig. 2—Right and left sides of National Series V motor, showing magneto and water pump connections and valve casings

Series V National

Although Presenting the General Characteristics of the Line, the New Model Shows a Dozen or More Constructional Changes

Left-Side Steering and Center Control Have Been Adopted, These Changes Necessitating Alterations in Motor Details—Stroke Longer and Bore Smaller than in Previous Types

WHILE National automobiles have not been manufactured on a yearly basis since the latter part of 1910, a new type known as Series V has just been formally announced as the standard product of the Indianapolis factory. Although not known as such, it is really a 1913 car, and represents the last word in automobile construction in the eyes of its designers, who at the present time can foresee no future changes.

While a dozen changes have been made in the constructional make-up, with the object of eliminating as far as possible noise in the gears and the engine, the Series V cars present the same general characteristics and have all the National earmarks which have come to be looked upon as standard in cars of this name.

The most important change is the adoption of left-side steering and center control, a tendency which is fast gaining ground with American automobile makers and which has such points as facility in negotiating corners, ease and safety in going around other vehicles and easy access to both front seats in its favor.

This change has necessitated the shifting of the inlet valves and manifold and the carbureter to the left side of the motor, and the placing of the exhaust valves, water pump and magneto on the right. This has not changed the design of the motor in any way, the T-head, four-cylinder construction being retained. Twin castings are used.

The motor is supported on the chassis frame by brackets at the forward ends which are booted to the upper half of the crankcase. At the rear end of the engine there is a cross piece which is fastened to the upper half of the crankcase also, but over the rear main bearing between the end of the crankcase and the flywheel.

Longer Stroke and Smaller Bore

The cylinder dimensions are 4 7-8 by 6 inches, a slightly longer stroke and smaller bore than in the previous type, Series S, the motor of which has 5 by 5 11-16-inch cylinders. The inlet and exhaust cams of this new engine are designed for maximum power and for quiet running at the same time. Although the cylinder sizes have been changed, the horsepower is rated the same as formerly. The car, however, will develop 17 per cent. more power than its predecessor, it is claimed.

The crankshaft and all studs used throughout the engine are made of chrome vanadium steel. The main bearings are made of Parson's white bronze, while the connecting-rod bearings are constructed of white metal with bronze backs. Bearings of such design are commonly called bronze-filled ones. This bronze backing feature is new in the National motor.

There is no change in the design of the pistons, the slightly domed head and inside web bracing being retained. Four eccentric rings are placed above the wrist pin, which is held in place by a single set screw, passing through one of the bosses.

The inclosing of both the ignition and exhaust valve springs is new. By thus housing the tappet rods and springs in special pressed steel jackets, no dirt or grit can get into the lifters or their bearings and the aim for engine silence is aided, since any

noise which the tappets may make is deadened by the inclosing jackets.

These housings for the springs and tappets are made easily removable by being split along their length. Spring clamps hold the two halves together. No screws or bolts are required to hold these clamps in place, making it a very simple matter merely to open the two halves, and to remove the housings from their positions. They rest upon the top of the flanges on the push-rod guides.

The constant circulation and partial splash oiling system which has been used for several years has been retained. There is a constant level, force-feed oiler, with a gear-driven pump, thus positively oiling all working parts of the motor. The oil overflows from the reservoirs, into which the ends of the connecting-rods dip into the bottom of the crankcase. From this lowest point the oil is forced back to the bearings and thoroughly lubricates the working members.

The water pump, while it is of the same centrifugal type, is made slightly larger than on previous models. It is placed forward of the magneto on the right-hand side of the motor, and is positively driven by gearing from the crankshaft.

Magneto Double Distributer Type

The Schebler carbureter is retained and is of the 1 3-4-inch size on all models except the roadster, which is equipped with the 2-inch size. A metal strap fastens the carbureter rigidly to the crankcase at a point a little forward of the center on the left side of the motor. A Miller carbureter is made optional on the new roadster, and a Diezemann type on the touring cars and the toy tonneau model.

A new ignition system replaces the two separate ignition systems which were formerly used on the touring cars and roadsters. Series V touring cars and toys are equipped with Bosch double-distributor magnetos of the high-tension type. This ignition is also augmented by the use of a storage battery. There are two sets of spark-plugs which are located in the valve caps in the cylinder heads. The only change from Series S types is the magneto itself, which, while it is of the same make as formerly used, is of the double-distributer type instead of the single type. On the roadster the ignition system remains the same. A double-distributer Splitdorf magneto with two sets of spark-plugs and storage battery are used. By each of these systems, the use of double distributers fires both sets of spark-plugs simultaneously on either the battery or the magneto.

Pressure feed is used on the gasoline tanks of all models, the pressure being secured from a small pump driven from the camshaft. This pump is located in the crankcase, and is capable of producing a pressure of 2 pounds. A cam actuates the 1-inch piston of this pump. Attached to the piston by an arm extending from the piston head is a roller which is held against the cam by means of a stiff spring 5-8-inch in diameter. A ball check valves allows the compressed air to pass from the piston barrel on the in stroke of the piston to the pipe leading to the gasoline tank. In the Series S only the roadster was equipped with this pressure pump on the gasoline tank, gravity being relied upon to convey the fuel to the carbureter.

The fan, which is of the adjustable ball-bearing type and is attached to the engine base, is made in one piece of pressed steel and is driven by a broad leather belt from the pump or magneto shaft. This unit fan construction is new, the blades being formerly riveted to the arms.

A single-cylinder tire pump has been added. This is located

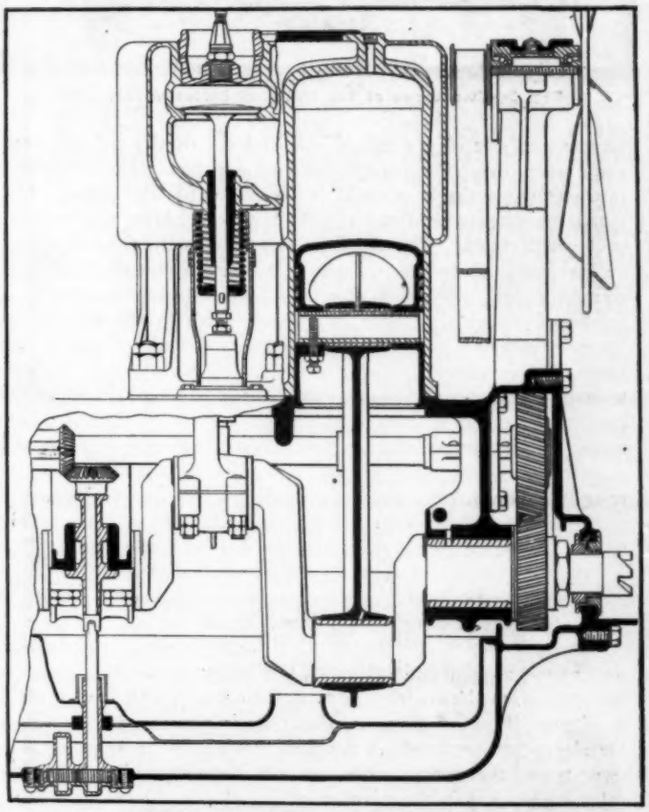


Fig. 3—Section through crankcase. Note timing gears, valve and oil-pump drive

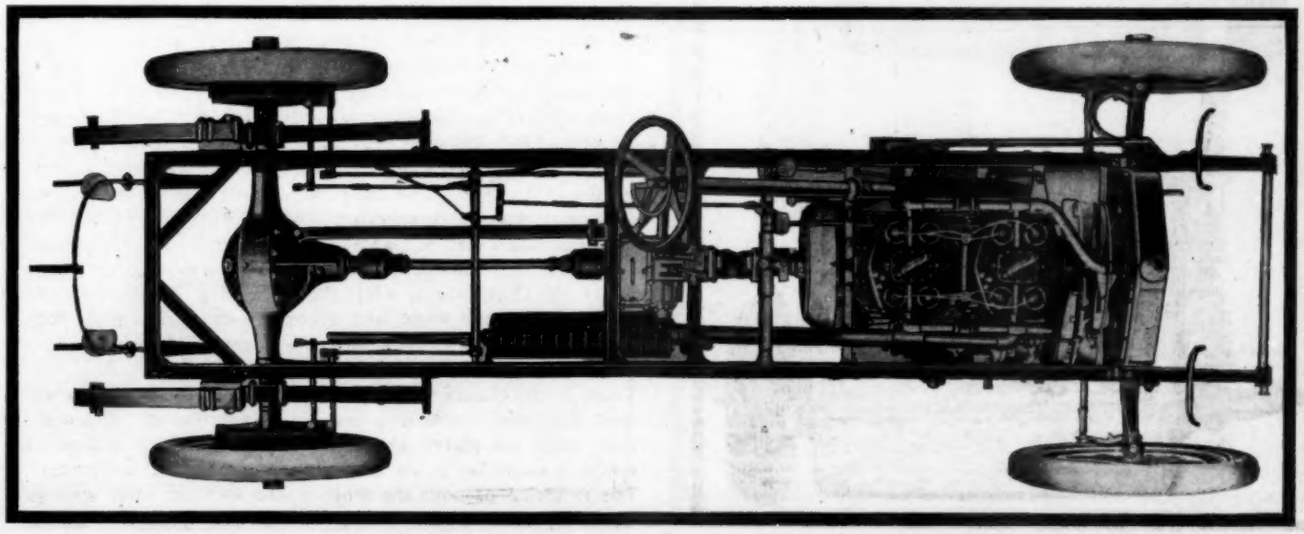


Fig. 4—Plan view of the Series V National chassis, showing arrangement of torque and drive members

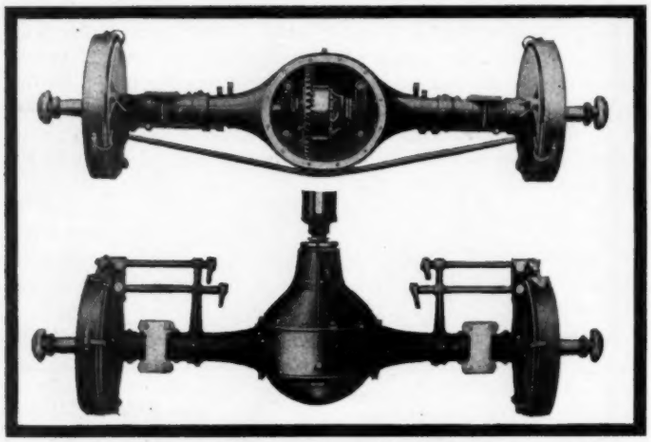


Fig. 5—Two views of the National Series V rear axle

on the left side of the motor and in front of the exhaust camshaft gear case. It is driven by a cone clutch, which is thrown into engagement only when it is desired to use the pump. This clutch operates within the camshaft gear, making a very compact construction. The clutch is connected with the crankshaft of the pump, the piston of which is operated through a 5-inch connecting-rod. This piston is 1 3-8 inches in diameter and has a stroke of 3 inches. There is a check valve in the top of the pump cylinder through which the compressed air is sent to the tires. Air is admitted to the cylinder for compression through a small spring-seated poppet valve which is also located in the cylinder head. It is opened by suction caused by the downward stroke of the piston, the air entering through holes in the flat sides of the hexagonal nut which screws the valve housing to te cylinder head.

The radiator is supported on trunnions instead of being bolted to the frame by means of plates, as was formerly done. This revives the radiator of many of the ordinary jars and jerks, and also makes its removal from the frame a very simple matter. It is of the straight-line, cellular type.

The dash control of the air to the carbureter is retained as well as the auxiliary air valve on the intake pipe. This latter is operated from the steering post as formerly, but the valve itself is of new form. A small poppet type is now used in place of the sleeve arrangement on previous models. The steering post lever opens the poppet valve against a spring which holds the valve on its seat in the usual way.

No change has been made in the cone clutch and it is retained at the same size. It is a self-contained aluminum cone, which is

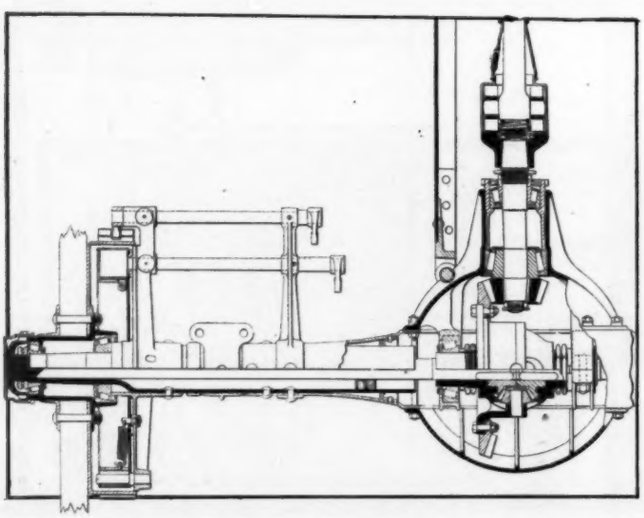


Fig. 6—Sectional view showing rear axle and drive-shaft

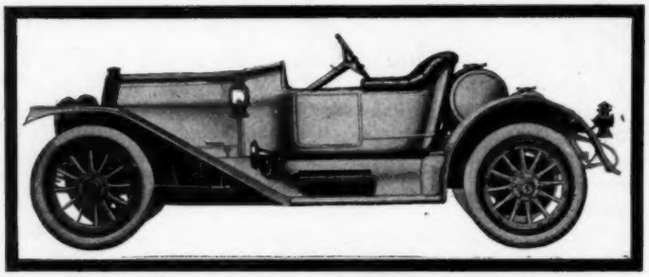


Fig. 7—Illustrating the new National 40 Roadster

leather-faced and spring-cushioned to give gradual engagement. It is so designed as to be removable without disturbing the transmission in any way.

In the transmission, however, a number of changes have been made. Silico-manganese steel oil-tempered gears are now used. There are three speeds forward and a reverse, as formerly, and annular ball bearings are used on the main and countershafts. The transmission has been virtually turned end for end so that the countershaft runs at a much lower speed than in previous types. The designers claim to have succeeded by this scheme and by special cutting of the gear teeth in rendering the transmission perfectly silent.

Rear System is Entirely New

The transmission case is fastened to the chassis frame by means of two channeled cross members. The forward support is bowed so as to pass underneath, while the rear one is straight, the rear end of the transmission case being fastened under it by means of two bolts.

Two universal joints on the propeller shaft are now used instead of one, as formerly. They are at the ends of the shaft, one just to the rear of the transmission case and the other forward of the differential housing. A torsion member of pressed-steel channel section replaces the former torsion tube. This member runs to the left of the drive shaft and fastens at its front end to the rear cross support of the transmission case and to the differential housing at its other and larger end.

The rear system in the Series V cars is entirely new. The differential and driving pinion are housed within a pressed steel case which has a large steel support for the gears. Cast steel

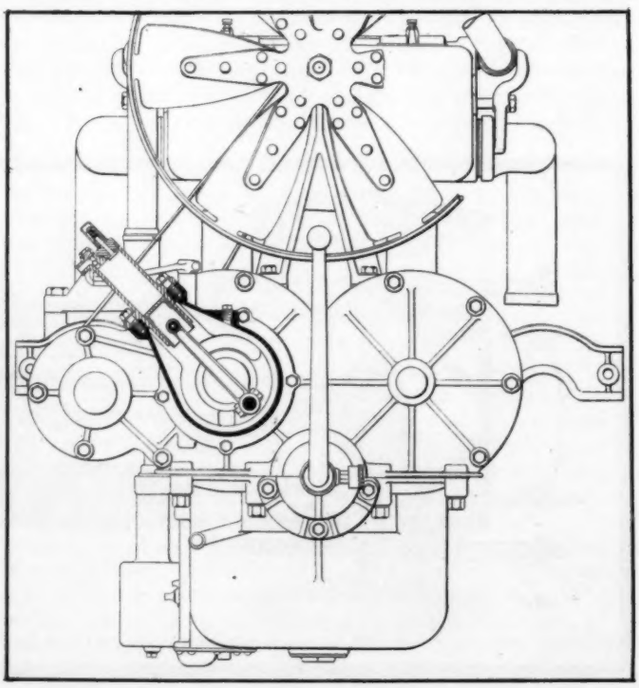


Fig. 8—Front view of motor with single-cylinder tire pump

was formerly used in the construction of the differential housing. The new design permits the housing to be thrown out of line without affecting the mesh of the gears.

The floating type of axle is continued, the inner axle being used only as a driver. The wheels are mounted on a double row of Timken bearings on a hollow axle, which carries all of the weight. Since the housing is made in three pieces, the whole is readily accessible, as may be seen in Fig. 5.

Internal expanding foot brakes and external contracting emergency brakes are retained, although they have been made considerably wider and are lined with Thermoid, a specially prepared brake lining. The brakes on previous models had no brake linings, a metal-to-metal system being used. The brakes continue at the same diameter of 16 inches.

The front axle is of I-beam section and it is a one-piece forging. The general form of axle has been retained, the center being bowed. There are adjustable roller bearings in the hubs and also at the tops of the yokes.

The frame is of pressed steel, wide-flanged and of 4 1-2-inch channel section. It is curved up over the rear axle, and there are diagonal braces which are riveted in place across the rear corners.

No change has been made in the suspension, other than the lengthening of the rear three-quarter scroll elliptic springs from 48 inches to 50 inches. The rear half-elliptic remain 40 inches in length. All springs are 2 1-4 inches wide.

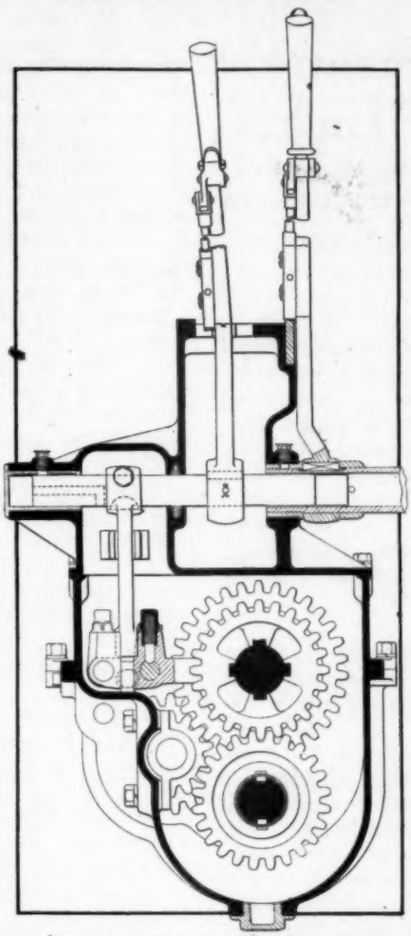


Fig. 9—Transverse section through the gear-set housing, showing control

The steering system gear is of the worm-and-gear type with ball and joint connections to the steering knuckle. The steering wheel is 18 inches in diameter, and the angle of the steering post has not been altered. The quadrant, on which are mounted the spark and throttle levers, is placed above the wheel, while the auxiliary air valve lever is located just below the wheel on the column.

The clutch and brake pedals and accelerator pedal have been accorded the same location on the floor as in the other models, although an aluminum heel rest has been added to assist in the use of the accelerator.

On all models except the roadster, rectangular gasoline tanks are carried in the rear, being hung from the frame. On the roadster the tank is of circular form and is mounted back of the seat. The tanks of the former have a capacity of 21 gallons while the roadster tank will hold 30 gallons. In the tanks there are fine wire mesh strainers for separating gasoline and water.

The wheelbase of the touring cars and toy tonneau cars has been lengthened from 124 inches to 128 inches, while that of the roadster remains 120 inches. The tire sizes have been changed from 36 by 4 inches on the roadsters, toy tonneau, and five-passenger touring car models to 36 by 4 1-2 inches on the toy tonneaus and five-passenger types and 34 by 4 1-2 inches on the roadster. This latter was sold with the option of this size of tires on the Series S type. The tire size of the seven-passenger car has been changed from 37 by 4 1-2 to 36 by 5 inches.

Very advanced designs in bodies are noticeable on all of the Series V cars. They present a lower and more rangy look than their predecessors. This is partly due to the fact that they are suspended 2 1-2 inches lower than the Series S machines, and partly because they have been designed along lines set down by a famous German body builder.

The mudguards have been made plain and they are held in place by substantial irons to prevent any vibration. These guards are wide and continuous and perfectly smooth on the upper side. There is no corrugation following along the edge. A metal dust shield is placed between the frame and the running board. Shields have also been placed over the rear spring shackles. Detachable metal dustpans protect all the working parts of the transmission and the under part of the engine from water and dust.

All models are finished with black enameled and nickel-trimmed parts instead of brass as in previous models. Ventilators are placed in the dash on the touring car and toy tonneau types. Two small boxes are also placed on the inner side of the dash for the safekeeping of articles. These little boxes are furnished with locks.

The inner luxuriousness of the touring cars has been carried out to a higher degree of perfection than in earlier models, 10-inch upholstery being now used instead of 5-inch. Within the tonneau there is a coat rail and a leather protector on the rear of the front seat. Tools are carried under the front seat.

Firestone demountable rims, Prest-O-Starter, electric lights and tire carriers, Fig. 11, are standard on all models.

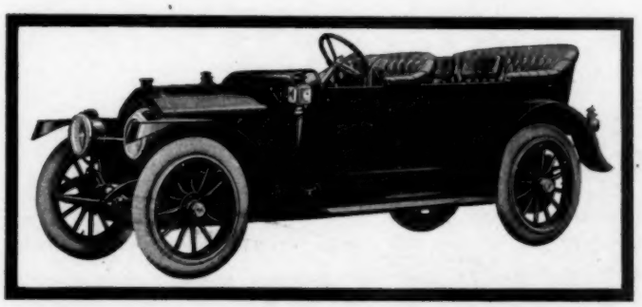


Fig. 10—Illustrating the National 40 touring car

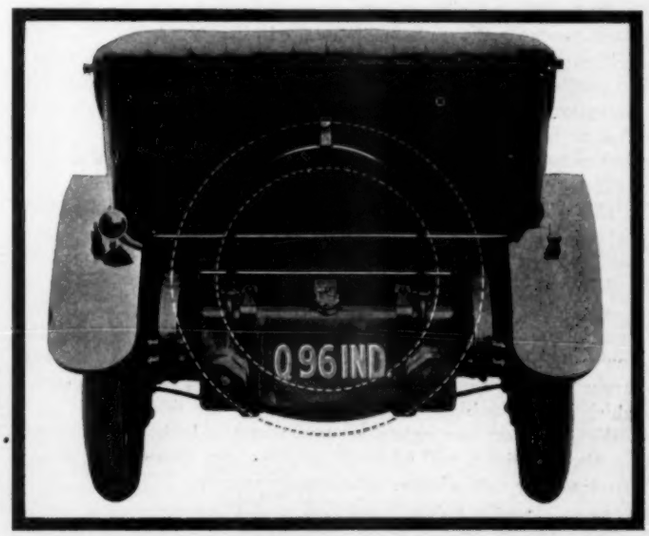


Fig. 11—Rear arrangement of touring car models

Dynamo Requirements for Electric Lights*

Voltage Needed for Lamps of the Desired Capacity and for Different Types of Motor Designs

Metropolitan Section of the S. A. E. Hears Interesting Paper on this Important Subject

IN determining the necessary qualifications for a dynamo lighting system for any particular use, the following points immediately become of importance:

(1) The lamps to be used.

(2) The dynamo output needed.

(3) The dynamo speed and the method of driving the dynamo.

(4) The proper size storage battery to be used with the dynamo selected.

(5) The type of wiring.

The most important of these is "What lamps to use."

After determining the lamps to be used we immediately know the amperes taken by these lamps, and from this the other points can be readily deduced.

There are only three size bulbs now in general use for headlight work, these being respectively 16, 21 and 25 candlepower. For small motor cars which travel at comparatively slow speed, and where the owners would be satisfied with light that while better than acetylene lights usually supplied with these small cars, is still not the most powerful, and where he will not be liable to compare his lights with those of friends who have higher power to the detriment of the 16-candlepower lamps, 16-candlepower is undoubtedly ample. On the higher powered cars the 21-candlepower bulbs are in almost universal use today. These will give ample light for driving up to a speed of say 40 miles an hour at night, illuminating the road far enough ahead so that any object may be observed in time to stop almost as well as in the daylight, and in fact gives all the light that is needed.

Such lamps when used with a shallow parabolic reflector will light a road 50 feet wide for the full width of the road from the front of the car to a point over a quarter mile away. A deep parabola of the same focus will light the road even further, but will not give as much light at the sides close to the car.

Where extremely high-powered cars are used running at very high speed and where very large reflectors can be used, 25-candlepower bulbs are sometimes used.

It must be realized that with small reflectors built to take a 16-candlepower bulb, the insertion of a 21-candlepower bulb will not give the proportionate larger amount of light on the road that 21 is to 16, and similarly a 25-candlepower bulb in a reflector built for 21 candlepower will not give sufficient additional light to warrant its use.

The reflector should be adapted for the particular size bulb to be used, and for this reason there is little use in using large candlepower bulbs in small reflectors.

With a commercial reflector having the greatest diameter of 8 inches, a 16-candlepower bulb is about all that can be economically focussed. With one of 10-inch diameter a 21-candlepower bulb should be used, and there is little use in using a bulb larger than 21 candlepower unless you have a 12-inch reflector, which is very seldom seen on account of the large size.

We can therefore safely assume that the bulbs to be chosen for the headlights will be of 21 candlepower, these being almost universal for cars of over 25 horsepower today.

The side lamps and rear lamps are signal lamps only, and for these bulbs of small candlepower can be used. Four candlepower or 2-candlepower bulbs are adequate, and it is customary to use 4-candlepower side lights, and 2-candlepower rear lights. The amount of current taken by these side and rear lights is so small that there is no objection to using 4-candlepower bulbs for all three, or 2 candlepower for all three, but the desirability to have a brilliant light at the side, for appearance, has led to the use of 4-candlepower bulbs. Frosting these bulbs in the side lights gives a very pleasing appearance and I think will be very largely adopted in the near future.

In addition to the heads, sides and rear, the car will probably be equipped with such current consuming devices as a speedometer light and electric horn, very possibly a cigar lighter, in the tonneau or limousine, and similar lights. None of these lights, however, is used for a very long period of time, and in designing the balance of the system after having decided on the five main lamps it may be safely assumed that the overload capacity of the outfit will take care of these additional loads which are run for a short time only.

We have therefore assumed that the lamp load on an ordinary car should be two 21-candlepower headlights, two 4-candlepower sidelights and a 2-candlepower rear light. The two headlights will take 7 amperes, the two side lights 1.7 amperes, the rear light .6 ampere, making a total lighting load of 9.3 amperes.

The second point we have to determine is the dynamo output needed.

We have already assumed the light load to be 9.3 amperes. In order to make sure that we have ample overload capacity to take care of the many short loads made by the horn, speedometer light, etc., the dynamo should be capable of delivering to the storage battery, slightly more amperes than is required by the lamp load. For this reason an ampere output of 10 amperes of the dynamo has been almost universally accepted as the proper amount when such a lighting equipment is used. This will keep the storage battery always up to the best efficiency, and at the same time it is small enough, so that the storage battery will not have to have too large plates in order to run without undue deterioration.

The dynamos should be so geared to the car as to give its full output at from 15 to 18 miles an hour, and any speed above this.

At a speed lower than 15 to 18 miles an hour, the car will not be driven for more than a very few miles with all the lights lighted, and the reserve capacity of the storage battery will more than make up for this short time. Of course when the car is being driven in the city where the headlights are not being used, it often runs slower than this speed, but at these lower speeds the dynamo is generating a proportionately smaller amount and will give ample current to take care of the two sides and the rear lamp which takes only a total of about 2.3 amperes.

A shunt-wound dynamo which will deliver 10 amperes at say 15 miles an hour, will deliver 2.3 amperes at 8 to 9 miles an hour, so that whenever the car is running it will supply ample current for the sides and rear lamps.

We have now decided that the lamps to be used continually will be two 21-candlepower heads, two 4-candlepower side lights and a 2-candlepower rear lamp. Also for this we will need a dynamo of 10 amperes at from 15 to 18 miles an hour.

The next point is at what speed of the dynamo should we get 10 amperes output, or, in other words, what shall be the ratio of speed between the dynamo and the engine, and what shall be the method of driving the dynamo.

These two points are so inter-related that they should logically be considered together.

The size, weight, and consequently cost of the dynamo, is determined not only by the ampere capacity but also the speed at which the dynamo will deliver this 10 amperes capacity into a 6-volt, 3-cell lead battery.

In this paper I will not enter into discussion as to the relative size, weight and cost of shunt series compound or magneto type

*Paper read by Leonard Kebler, member Society Automobile Engineers, before Metropolitan Section, New York, on April 24.

dynamos, and simply limit my statements to the fact that in dynamos of any one type, the size, weight and cost is determined by the ampere capacity and the speed at which this number of amperes can be put into a 3-cell lead battery.

The cost of a dynamo which will deliver say 6 volts and 10 amperes at 1,500 revolutions per minute, is 30 per cent. less than one which gives the same output of 1,000 revolutions per minute and it is less than half the cost, and of about half the weight of one designed for the same output at 500 revolutions per minute.

A shunt-wound dynamo designed to put 10 amperes into a 3-cell battery at about 1,000 revolutions, weighs approximately 21 pounds, and can be made approximately 8 inches long by 5 5-8 inches high by 4 3-4 inches wide. If we reduce this speed to 500 revolutions the weight becomes approximately 33 pounds, and the dimensions approximately 9 1-4 inches by 7 1-2 inches by 4 3-4 inches.

This 1,000-revolution dynamo should be run at about twice engine speed for the best results, and the 500-revolution dynamo should be run at engine speed for the best results. The question immediately comes up as a matter of judgment, whether there is sufficient advantage in running at the slower speed, to make up for the added weight and the added cost.

It will be found in general that where a shaft is provided on the engine to which the dynamo can be coupled, and this shaft runs at engine speed, the added weight and cost of the engine speed dynamo is warranted because it eliminates the cost and complication of sprockets and chain for driving the dynamo. But where such a shaft would have to be put specially in the engine and driven by gears, or when some shaft already projecting runs at engine speed, but is not so located that the dynamo could be directly coupled to it, and consequently either gears or sprockets and chain have to be used, there is little question but that a dynamo delivering its full output at 1,000 revolutions per minute and running at about twice engine speed is the happy mean in the weight cost and size. A dynamo which will put 10 amperes into a 3-cell battery at 1,000 revolutions, driven at twice engine speed on a car with 36-inch wheels, geared 3 1-2 to 1 on the back axle, will start to charge the battery at from 6 to 7 miles an hour and will give enough current to supply all the lamps—about 10 amperes at 15 miles per hour.

The same dynamo on a car geared 3 to 1 with 36-inch wheels starts to charge the battery at 9 miles per hour, and will deliver enough current to take care of all the lamps at 18 miles per hour. Such a dynamo I believe to be the ideal one where there is no provision made for driving directly at engine speed.

A machine running at higher speed than this has not sufficient advantage in less weight and cost to warrant the higher speed of the chain and the higher speed in revolutions per minute of the armature and to warrant the additional wear on the bearings and additional chance for noise. At the same time the use of a dynamo at less than twice engine speed to get a reduction in chain speed and wear on the bearings has not sufficient advantage to warrant the use of a larger, heavier dynamo running at say engine speed and driven by chain or gears.

On a dynamo driven by 3-8-inch pitch silent chain at twice engine speed, sprockets of 30 and 15 teeth would be used. At 45 miles per hour this chain would run at 1,500 lineal feet per minute and at 60 miles per hour at 2,000 feet per minute. This is not an excessive speed, but if a dynamo giving its output at 1,500 revolutions per minute were used running at 3 times engine speed, we would use 45 and 15 tooth sprockets and the chain speed becomes 2,250 feet per minute at 45 miles per hour and 3,000 at 60 miles per hour, which is too high for efficiency or long life. We may therefore decide not to run our dynamo at over two times engine speed.

On the other hand where it is possible to drive at engine speed through an Oldham coupling, the ideal case is undoubtedly reached, and in this case the additional weight and cost of the dynamo is warranted, as we save the additional cost of sprockets and chain and eliminate the necessity of oiling these, etc.

Having determined the lights to be used, the dynamo output and the relative speed of the dynamo to the car, the next point to determine is the method of driving the dynamo.

A very useful method of driving the dynamo is to extend the pump shaft through the pump, leaving an extension back of the pump to which the dynamo can be directly coupled by means of an Oldham coupling.

In other cases it is possible to have the armature shaft of the dynamo extend through both ends and drive from the timing gears through the dynamo armature to the magneto, having the magneto and the dynamo lined up in tandem. In each of these cases a dynamo running at engine speed is used for the 4-cylinder car and 1 1-2 times engine speed for a 6-cylinder machine.

When neither of these methods is possible and it becomes necessary to drive the dynamo by gears or silent chain, we will then use the higher speed machine, running at about twice engine speed, and this can be driven in a number of different ways.

Where the pump is driven separately from the magneto it may be driven at twice engine speed and the dynamo can be run directly from the pump shaft through an Oldham coupling.

(*To be continued next week.*)

Calendar of Coming Events

What the Months Ahead Have in Store for the Sport-Loving Automobilist

Shows

April 29-May 4	Burlington, Vt., Annual Show, State Armory, Burlington Merchants Protective Association.
May 6-11	Philadelphia, Show and Carnival, Belmont Race Track, Narberth, Pa., Belmont Motor Club.
May 16-19	New Orleans, Annual Meeting National Good Roads Congress.
June 17-22	Milwaukee, Wis., Convention and First Annual Show, National Gas Engine Association.
June 27-29	Detroit, Mich., Summer Meeting of the Society of Automobile Engineers.
July 10-20	Winnipeg, Man., Canadain Industrial Exhibition.
July 22-26	Detroit, Mich., Cadillaqua Week.
Sept. 23-Oct. 3	New York City, Rubber Show, Grand Central Palace.

Race Meets, Runs, Hill Climbs, Etc.

May 4	Santa Monica, Cal., Annual Road Race, Motor Car Dealers' Association.
May 5	Los Angeles, Cal., Motordrome Meet.
May 11	Atlanta, Ga., Hill Climb, Atlanta Automobile and Accessory Association.
May 17-18	Denver, Col., Track Meet, Colorado State Automobile Association.
May 18	Washington, D. C., Reliability Run.
May 30	Indianapolis, Ind., Speedway, 500-mile race.
May 30	Salem, N. H., Track Races, Rockingham Park.
June 6	Washington, D. C., Reliability Run, Washington *Post*.
June 8	Narberth, Pa., Track Races, Quaker City Motor Club.
June 20	Algonquin, Ill., Annual Hill-Climb, Chicago Motor Club.
June 20-22	Portland, Me., Reliability Run, Pine Tree Motor Contest Association.
July 3-5	Belle Fourche, S. Dak., Second Annual Track Meet.
July 4	Petersburg, Ind., Track Meet.
July 4-5	Taylor, Tex., Track Meet, Taylor Automobile Club.
July 4-6	Old Orchard, Me., Beach Meet, Old Orchard Automobile Association.
July 5-6	Tacoma, Wash., Road Races.
July 15	Milwaukee, Wis., Reliability Run, Wisconsin State Automobile Association.
Aug. 8-10	Galveston, Tex., Beach Meet.
Aug. 23-24	Elgin, Ill., National Stock Car Races, Chicago Motor Club.
Sept. 2	Indianapolis, Ind., Track Races, Speedway.
Sept.	Chicago, Ill., Commercial Vehicle Test, Chicago Motor Club.
Oct. 5	Philadelphia, Pa., Annual Fairmount Park Road Race, Quaker City Motor Club.
Oct. 7-11	Chicago, Ill., Reliability Run, Chicago Motor Club.
Nov. 6	Shreveport, La., Track Meet, Shreveport Automobile Club.

Foreign

May 26	Barcelona, Spain, Cup of Spain Road Race, Automobile Club of Catalonia.
May 26	Sicily, Targa Floria.
June 15-23	Vienna, Austria, International Tour, Austrian Automobile Club.
June 25-26	Dieppe, France, Grand Prix de France, Automobile Club de France.

THE AUTOMOBILE

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A Business Inconsistency

THE introduction of the motor truck has brought to the front a most apparent business inconsistency, one that is not local to any industry that has taken up the use of power delivery of merchandise, but which is met with in nearly every case where motor power has supplanted horse transportation.

This is an age of factory organization, interior factory economy, and the practice of manufacturing economics from A to Z within the factory walls. The factory managers have brought from the metropolitan centers the brightest efficiency experts that the country affords. These have gone through every factory department; they have found which departments make money, which operate at a loss and which are in the lukewarm state. They have compiled voluminous reports on conditions as existing and equally voluminous recommendations on necessary changes for the manufacturer's good. All of these recommendations have been accepted, lived up to and the results accruing from their installation have in some cases turned the tide of affairs from the ruinous to the profitable side of the ledger. Everything that could be done has been done. Nothing has been neglected, nothing overlooked.

But these factories and merchandising plants have stopped with the factory walls. They have failed to even go outside. The efficiency expert has told them everything as to production, but he has left them here. He has apparently forgotten that after production comes delivery—delivery of the marketable product to the warehouse, to the railroad depot or to the consumer, according to conditions.

The delivery problem is a vital one. The recent activities of the automobile makers when there was a shortage of railroad cars at Detroit, Cleveland, Toledo and Indianapolis demonstrated this. For the first time the automobile maker realized how serious it is when he has cars on hand, when the agent at the other end of the line is clamoring for machines to satisfy impatient customers and when the railroad facilities are wanting. What happened in this field a few weeks ago is happening every hour of the working day in many of our big industrial and mercantile plants in nearly every city and town in America. What happened in the railroad field is happening every day of the week in the field of industrial transportation in which the motor truck or horse transportation operates.

Take an example of this shortage of transportation facilities: In a large New York laundry, housed in a modern ten-story cement construction building, there is but one power elevator which is used to handle all of the laundry from the ground floor to the top floor as it goes step by step through the cleaning processes. This elevator is also used to bring all of the finished laundry from the top floor, where it is put in packages, to the loading platforms where the motor trucks and horse vehicles wait. At this loading platform there is room for but a single vehicle and generally this vehicle stands for 15 to 20 minutes waiting for its load, because the elevator service is partly occupied with lifting unfinished laundry from one floor to another. While the wagon is waiting a long time at the bottom of the elevator there are four or five horse-drawn wagons waiting their turn to get to the elevator position. These wagons wait from 45 minutes to 1 hour and 30 minutes. The laundry company does not object to these waits. They are necessary in that they give the horses the rest which they need. The laundry is operating on horse lines, and at horse speed so far as delivery of the goods is concerned, and the proprietor is quite plain in his statements that he cannot use motor vehicles successfully because of his horse-pace building. He goes further and regrets that his building construction will not permit of his putting in another elevator for delivery service, and is more or less contented with horse delivery service, accepting it as a necessity because of the physical conditions surrounding his building.

This example is but one of the many that disclose business inconsistencies. The laundry industry is one in which special machinery has been designed until the last word has been said. Everything has been done to add to internal efficiency. Experts have analyzed factory interiors and have placed the machinery in the most economical points, but the delivery business has been entirely overlooked. Even in new modern buildings not over 2 years old everything has been designed for horse pace, and this in industries where machinery is everything and where one would think the motor vehicle would be taken up with the utmost avidity.

There exists a grave danger in having this regime of horse-pace building construction continued. If every new industrial plant erected this year and next year is built for horse delivery work, the advent of the motor truck is going to be delayed proportionally. The archi-

tects must be impressed with the fact that this is an age of power transportation and that their new buildings must be designed for the adequate use of motor trucks; that the regime of the horse is passing and that no longer must his performance be taken as the criterion of work. The new standard is the motor truck. It is the thermometer that must be used. The sooner this is realized the better. It is the duty of the motor truck makers to bring this to the attention of the captains of the different industries to whom they expect to sell vehicles. They must bring these facts to the attention of the leading architects and of the building commissioners; in a word, everybody must realize that horse pace is passé; that this is the day of motor pace. Industrial concerns must realize that the field of the efficiency expert must be expanded. His efforts must extend beyond the factory walls. He must wrestle with transportation problems because the facilities for transportation prescribe the limits of the business. It is the duty of truck makers and truck dealers to push this with enthusiasm.

Bay State Legislators in Air

Are Uncertain as to Proper Terms of New Motor Law—Two Bills Recalled

BOSTON, MASS., April 29—The committee on roads and bridges of the Massachusetts legislature is having the hardest task of its entire session in trying to force out some sort of motor legislation this year.

Some members of the committee knew little or nothing about automobile conditions, and the two bills they put in showed their lack of judgment. The bill to increase the fees was given to the legislature twice, and recalled each time by the committee. Now a new sub-committee comprising Senator Eldredge, Representatives Collins, Burns and Turner are wrestling with a new bill.

Where the committee has made its mistake is in believing that because a flat rate of 50 cents per horsepower was satisfactory to some of the members and officers of the Massachusetts State A. A. it was satisfactory to the automobilists, when as a matter of fact the state association represents but a very small percentage of owners. As opposed to the bill there are the Boston Automobile Dealers' Association, International Geneva Association, Massachusetts Automobile Operators' Association, Taxicab and Carriage Drivers' Union, Taunton Physicians' Club and thousands of individual motorists.

Some idea of how members of the committee allow themselves to be led was furnished by Representative Collins, who comes from Amesbury, a town more vitally interested in the motor industry and dependent upon its support than probably any other town in the state, who in debate on the horn bill said that as the highway commission favored the bill it must be all right for him to vote for it. And that is how some of them have been doing on the fees and truck bills. The truck bill, which was put in under the innocent guise of a title "To protect and preserve the highways" and framed by the highway commission, has also had its rocky road, and that, too, has been sent back to the committee for further pruning and perfecting.

Some report is expected during the week and there is talk now that the compromise calls for $5 for 10 horsepower and under; $7.50 for cars from 10 to 20 horsepower, and $12.50 for cars from 20 to 30 horsepower.

Motorists Kill Noxious Bill

BOSTON, April 29—The Massachusetts legislature last week for the second time killed the bill that would make it prima facie evidence that an owner was in or operating his car provided that the number was taken and given in court in an action of damages. Under this bill if a motorist were in Europe, and his car stored, and some irresponsible person took it out, or borrowed the numbers off it and figured in an accident, the owner could be sued and judgment obtained against him by default by merely proving that the numbers represented his machine.

Capital Wheel Tax Is Unjust

Washington Commissioners Favor Repeal—Chicago Passes Tax Law on the Quiet

WASHINGTON, D. C., April 28—Condemning the wheel tax on motor cars as unequal in its working, and declaring it was imposed by Congress without request of the municipal authorities for their opinion as to its advisability, the district commissioners have sent to congress, as a substitute for a similar measure introduced by Senator Martine, of New Jersey, a bill to repeal the tax.

The commissioners say they are in favor of the legislation proposed by Senator Martine, but recommend the enactment of their own bill, for the reason that they deem it in better form to effect the object to be gained.

The principal reason for recommending its repeal, the commissioners say, is at present there are these charges in regard to the tax, license fee, tags, etc. First: An operator's permit must obtained, for which a fee of $2 is charged.

Second: An identification tag is required at a cost of $2.

Third: A wheel tax is assessed against all motor vehicles, the fee being $3 for the first seat accommodating two passengers, and $2 for each additional seat.

Fourth: A personal tax is charged on each motor car at the rate of $1.50 for every $100 of its value.

Fifth: Should the motor car be a public vehicle a special license is required, the rate being $6 per annum for each vehicle not exceeding ten passengers.

Chicago Solons Pass Wheel Tax

CHICAGO, April 27—The city of Chicago has stolen a march on the motorists and has passed a new wheel tax ordinance without giving car owners a chance to say anything about the rates. The ordinance was passed March 4 and it went through so quietly that it was not known until yesterday that the measure was on the books. The city had a wheel tax ordinance, based on seating capacity, whereby anything over two-passenger capacity had to pay $20 per year, while the two-seated vehicles were assessed at the rate of $12. The new state law, which went into effect July 1, 1911, provided for a wheel tax based on horsepower, but gave the city of Chicago until May 1, 1912, under its old law on seating capacity. Before Chicago could operate under the state law it was necessary to pass a new ordinance and motorists were prepared to make a fight for as low rates as possible. The city, however, did not take the motorists into its confidence and put through the ordinance the way it wanted it.

The new ordinance goes the limit as to the amount of wheel tax fees, and starting May 1 the assessments will be $10 per year for cars of 35 horsepower and under and $20 per year for cars over that. Electrics will be charged $10 per year. Motor trucks, over 1-ton, $30; under 1-ton, $15.

Touring Into the Atlantic

Harpswell to Construct 18-Mile Route Over Orr's and Bailey's Islands in Casco Bay

Road Will Be on High Ground With a Fine View of the Atlantic

PORTLAND, ME., April 29—Motorists who visit Maine this summer will have a splendid chance to motor for miles right out into the Atlantic Ocean as a result of the improvements that the selectmen of the town of Harpswell have approved and which are now under way. These comprise road and bridge improvements which will make possible a ride of approximately 18 miles out into the ocean over Orr's and Bailey's Islands in beautiful Casco Bay that has been the exclusive playground for yachtsmen for years from all points on the New England coast.

For about 40 years there has been a contest among the people of Harpswell about the building of bridges to the islands. But at the last town meeting the matter was settled by the town voting to appropriate $3,000 for a wooden bridge across Wills Strait to connect Orr and Bailey Islands, and also $900 to repair the Orr's Island bridge connecting Orr's and Sebascodegan Islands and to cut down the grade of Orr's Island hill. A few days ago another town meeting was held and the sentiment in favor of the improvements was even much stronger and it was decided that not only should the work be done right away, but it should be done right. So it was voted to increase the appropriation for repairing Orr's Island bridge and for cutting down the hill to $5,000 and to spend $25,000 instead of $3,000 on the bridge between Orr's and Bailey Islands.

The Orr's Island hill has a grade of from 22 to 24 per cent., and this will be cut down more than half. The Wills Strait bridge will be of concrete and stone, 1,050 feet long, with a draw 30 feet wide, eliminating the objection to closing navigation.

These changes will make possible a ride from Brunswick out into the ocean to what is known as Jaquith's cut, where Half Way Rock lighthouse and the full sweep of the Atlantic Ocean may be seen. From Brunswick to Orr's Island is 11 miles; from there to Will's Strait 4 miles, and across Bailey's Island 2 miles. The road will be mostly on high ground so that there will be a fine view of the ocean nearly all the way. The distance from Portland is but a few miles. The hundreds of motorists who will make the trip will repay the town in increased business not only this year, but every other year.

Preparing for Road Congress

NEW ORLEANS, April 30—Energetic action on the part of Louisiana automobile owners and dealers, some time ago, secured for this city the annual meeting of the National Good Roads Congress. Now this same energy is being directed toward preparing for the entertainment and enlightenment of the 2,500 delegates who are expected to attend. The congress will be held May 16, 17, 18 and 19. The first efforts of the mayor and the committees which he appointed were devoted to raising the necessary funds for the entertainment of the guests. This has been accomplished and a tidy sum is on deposit ready to serve its purpose as soon as the visitor arrive. Work is now being concentrated in preparing information for the congress from the lessons that have been learned in building roads in Louisiana. Blue prints showing the different methods of construction and the materials used in the various classes of roads that have been built in this state are being made. Hundreds of photographs will show the roads at different times in their life. Great care has been taken to collect from the federal, state and private engineers all data which could be of service. Lessons drawn from the mistakes which have been made will be plainly brought out. While the congress in in session all delegates will be given an opportunity of seeing extensive stretches of shell roads. Automobiles will be furnished by local motorists, who will accompany the visitors to explain the features of this class of construction which is so popular along the Gulf Coast.

SYRACUSE, N. Y., April 27—The Automobile Club of Syracuse, has begun its season's campaign of sign posting. Four hundred signs at least will be posted this season, most of them this spring. The signs will be erected east to Oneida, where the Syracuse territory meets that of the Utica club; west to Auburn to meet the Auburn club; south 20 miles to meet the Cortland club, and north beyond Pulaski to meet the Watertown club. These clubs will co-operate in the work and more sign posting will be done through central and northern New York than ever before. Special care will be given a stretch of new state road from Oneida for the accommodation of through tourists.

HARRISBURG, PA., April 29—State Highway Commissioner E. M. Bigelow this week announced invitations for bids for the construction of the first six sections of road to be built as part of this year's program, the bids to be opened during the third week in May. The list includes: Section 17, national road, Washington County; section 1, main highway route No. 1 Susquehanna township, Dauphin County; section 3 on route No. 238, Hickory township, Mercer County; and portions of the following routes: No. 246, Westvale, Allegheny County; No. 47, East St. Clair township, Bedford County; No. 26, Buffalo township, Union County.

A Denver-Salt Lake City Road

Delegates From Principal Towns Between Cities Decide to Have Route Ready for Automobiles by July 1

SALT LAKE CITY, UTAH, April 27—One of the most important meetings of good road builders and boosters held in the West in recent years took place in Salt Lake this week when delegations from all the principal towns between Denver and Salt Lake City completed plans for a road between these two points.

Colorado and Utah, alive to the possibilities of transcontinental touring, believe they have, in the proposed route, the shortest and most scenic automobile highway that can possibly be constructed. Colorado did not wait in this matter and has already constructed its portion of the road from Colorado Springs to Grand Junction, near the western border of the state. It was to get action in Utah from the Utah line just west of Grand Junction to Salt Lake that prompted the delegates from Colorado to invade the Mormon State, and it must be admitted they got action.

Chairman C. P. Allen, of the Colorado state highway commission and a personal representative of the Colorado executive, headed the visiting delegation. They gathered delegates from all towns along the route until Salt Lake City was reached, when a conference with Governor Spry, of Utah, the state highway commission and the good roads committee of the Salt Lake Commercial Club resulted in a promise on all sides that this road would be in shape for automobiles not later than July 1 of this year. Governor Spry promised the use of the state convicts on the construction of the road at once, while the county commissioners through whose counties the road will pass have agreed to turn their good road funds over to this route.

This route will pass through the heavy mountainous counties of the two states, giving the tourists some of the most beautiful

scenery to be found through the Rocky Mountains. It will follow the railway practically the entire distance, giving ample accommodations in the various cities and towns for automobiles. The route was located a year ago as part of the shortest line between Chicago and the Pacific Coast.

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DAVENPORT, IA., April 27—Owing to the heavy rains of early April the bottom land roads of Scott, Muscatine and Clinton Counties near the Cedar and Wapsipinnicon Rivers have been rendered almot impassable and the supervisors are facing a serious problem in repairing the thoroughfares owing to the decrease in county finances due to the flat mill tax on moneys and credits. In some places the roads have been gullied to a depth of 18 feet, bridges carried away and the highways strewed with timber and débris. The worst condition is reported in Muscatine County, where the damage to the bottom roads reaches $20,000. There the supervisors have but $800 on hand for road improvement. The Scott County supervisors are also short of funds, and state that few repairs can be made on the country roads there. The township trustees are also without funds. So far the only road repairs made have been the result of individual work on the part of farmers.

DAVENPORT, IA., April 27—The towns along the I-O-A short line, which runs from Davenport, through Blue Grass to Muscatine, Washington, Sigourney, Oskaloosa and west to Council Bluffs, are interesting themselves with renewed vigor in improving and marking this southern road through Iowa. Data have been gathered for routing the section of the road from Davenport to Blue Grass. The Muscatine Club has marked the road from that city to Blue Grass, and the Davenport Club has pledged itself to maintain the eastern section of the line.

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Want $100,000 in 10 Days

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Richmond - Washington Highway Association Members Collecting Money to Build Virginia's Section

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RICHMOND, VA., April 29—"A hundred thousand dollars in ten days" is the slogan of the members of the Richmond-Washington Highway Association, who this afternoon began a campaign for the purpose of raising the necessary in Richmond towards the Virginia division of the Quebec-to-Miami International Highway. The city has been divided into twelve districts with an energetic soliciting committee in each district, manned by a district chairman. The plan was arranged at a meeting held last Friday night at the Jefferson Hotel, where enthusiastic speeches were made. The speakers thought it would not take more than 4 days to raise the $100,000, but it was thought best to make the campaign one of 10 days' duration.

The Richmond-Washington Highway Association is incorporated under the laws of the state of Virginia, and besides raising funds in Richmond will co-operate with civic bodies and other road associations in the towns and counties through which the Richmond-to-Washington highway will pass.

The enthusiasm throughout the territory to be traversed by the highway is high, and everything points to the success of the building of the Virginia connection to the great international highway. The Virginia branch will be extended to the North Carolina line, and work is expected to be commenced within a comparatively short time.

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CHICAGO, April 27—Blazing a trail for the Ocean-to-Ocean Highway Association, Harvey Herrick, road racing champion of 1911, driving a Case car and accompanied by Chester Lawrence, arrived in Chicago yesterday noon. They are bound for the Atlantic Coast.

Conserving Illinois Funds

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Chicago Organizations Seek to Turn into Its Proper Channel the Money Collected for Roads

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Legislature Forgot to Appropriate Money and It Has Lain Idle for Months

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CHICAGO, April 27—The state of Illinois has in its treasury $393,000 credited to the road improvement fund which has been accumulating since 1907, $253,000 of it having been collected since last July. The state has been unable to spend this because the last Legislature forgot to appropriate it. Governor Deneen, though, has on the call for the special session which convenes May 8 the matter of making this appropriation. A bill has also been introduced which seeks to establish the position of county superintendents which would add 102 names to the payroll, making 4,902, counting the present township officials, drawing from the road funds. Motorists and others have become alarmed at the prospect, and last night there was a meeting at the Sherman Hotel, in this city, which was called for the purpose of suggesting a way for spending the road fund.

At this meeting were representatives of the Illinois Bankers' Association, Illinois Highway Improvement Association, Illinois State Automobile Association, Chicago Automobile Trade Association, Chicago Automobile Club and Chicago Motor Club. It was pointed out that the present law which has collected this fund specifies that it shall be spent for permanent highway improvement, the money to be divided among the townships according to the amount each pays in the way of road and bridge taxes. The meeting passed a resolution which will be presented to Governor Deneen, opposing the distribution of the $393,000 by the special meeting of the Legislature and asking that it be kept intact "until such time as a modern, comprehensive plan of statewide improvement and maintenance of the roads be devised and put into operation by the Legislature." It was contended that if the fund is distributed as at present contemplated it would give to each township in the state the insignificant sum of $246, which would mean the practical dissipation of the fund without accomplishing anything. Some favor the money being used for the purpose of constructing a cross-state highway.

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Trunk Route in New England

PROVIDENCE, R. I., April 29—As a result of the action of the Rhode Island Legislature, work will be commenced soon on an extension of the trunk line reaching across the state in a northwesterly direction that will tap the road at the Connecticut line that leads to Hartford, and when completed it means that the capitals of the two states will be connected by a through trunk highway. As there are state roads connecting both these capitals with the Massachusetts highways leading to Boston, and a continuation goes north from the Hub to New Hampshire into Concord, it means that all four state capitals are to be on through state routes. With Maine starting on a campaign of goods roads, and Vermont also doing much road improvement the entire New England states are making rapid progress.

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BALTIMORE, MD., April 29—O. E. Weller, the new chairman of the Maryland Good Roads Commission, is mapping out plans for construction and repair work on numerous state thoroughfares. As a result of a trip over the Baltimore-Washington Boulevard a plan has been outlined for completion of work on this route. Chairman Weller will go over the Perryville-Elkton route and to Belair over the Harford road with the view of improving the road to Belair so as to make the distance from Baltimore shorter than by the Towson route.

BULLETIN News of the Week Condensed

How a Kalamazoo Reo dealer sidestepped the car famine and brought his cars over the roads from Lansing

FARMERS Should Examine Policies—As the result of many inquiries to the state insurance department, Lansing, Mich., regarding the storage of automobiles in barns covered by mutual fire insurance company policies, it is suggested by the department that farmers who have been in the habit of storing the automobiles in barns should examine their policies and the charter of the company which covers the barn to ascertain whether they are invalidating their policies by the practice.

Building 500 Automobile Cars—The American Car & Foundry Company, St. Louis, Mo., is building 500 automobile cars.

R. C. H. Has Service Station—The R. C. H. Corporation has secured a large service station at 148 Berkeley street, Boston, Mass.

Fire Wagon for Rochester—The first automobile fire apparatus for Rochester, N. Y., will arrive soon, and will be put in commission at once.

Tire Company Opens in Salt Lake—The Austin Tire & Rubber Company has opened for business in Salt Lake City. R. M. Austin is manager.

Partridge Is Ford Buffalo Manager—H. E. Partridge has been appointed manager of the Buffalo, N. Y., branch of the Ford Motor Car Company.

Form Kearny Auto Club—An automobile club, which the organizers expect will have at least fifty members, was launched at Kearny, N. J., recently.

Shelby County Auto Men Meet—Several hundred automobile owners of Shelby county, Ia., held an enthusiastic meeting recently to form an organization for boosting for better roads.

New Clubhouse in San Antonio—The perfecting of plans for the new club-house occupied almost the entire attention of the recent April meeting of the San Antonio, Tex., Automobile Club.

Another Company in Cambridge—Another automobile company has been added to the colony at Cambridge, Mass. It is the Cambridge Motor Sales Company, of which Jeremiah Surette is the proprietor.

American Plant in Mexico—An Ohio tire and rubber company has arranged with the Mexican government to establish at Mexico City a plant for manufacturing all kinds of rubber products, oil cloth, insulated wire, etc.

Acquires Rights to Self-Starter—The United States Light & Heating Company, New York City, has acquired the exclusive rights for the manufacture and sale of the Eveland electric self-starting and lighting device for automobiles and commercial vehicles.

Automobiles Invade Sawdust Ring—Two Buicks are being used by the Herbert A. Kline shows, Flint, Mich., both machines containing calliopes which are operated by compressed air. In addition there soon will be a specially built Cole car in use by the circus.

Milwaukee to Buy Roadsters—Six light roadsters for the use of the six assistant chiefs of the fire department will be purchased by the city of Milwaukee, Wis., within 30 days under a recommendation from the fire and police committee. The cars will not exceed $1,000 each in cost.

Milwaukee May Buy Motor Apparatus—It is expected that the purchase of motor fire apparatus by Milwaukee, Wis., will be authorized within 3 months, although nothing definite in the way of scheduling the probable requirements has been done. The Milwaukee fire department at present is using no motor fire apparatus of any kind, save the ordinary pleasure cars for the chiefs.

First Cole Wing Is Complete—The first wing of the new plant of the Cole Motor Car Company, Indianapolis, Ind., has been completed and President J. J. Cole has given the architect instructions to go ahead with the second. The wing is four stories high and the construction is reinforced concrete. It is 100 by 160 feet. When the plant is finally completed the company will have a U-shaped building 230 feet wide, 315 feet deep and four stories high. Two additional stories can be added at any time.

Pieper to Manage Remy Branch—George B. Pieper has been appointed manager of the Boston branch of the Remy Electric Company, Anderson, Ind.

Federal Branch in St. Louis—The Federal Tire Company, Milwaukee, Wis., has taken a branch location at 4628 Olive street, St. Louis, Mo. L. E. Allmen has been placed in charge.

Hearn a Kelly-Springfield Agent—The Hearn Tire & Rubber Company, a jobbing and retail concern at Fourth and Gay street, Columbus, O., has taken the central Ohio agency for the Kelly-Springfield tires.

Tire Sales Company Opens Branch—The Petty Tire & Rubber Company, St. Louis, Mo., has opened a branch in Memphis, Tenn., with H. G. Wedler in charge. The company handles the Kelly-Racine line.

Kemp Company to Build—The Kemp Brothers Automobile Company, Minneapolis, Minn., will erect a $50,000 electric charging and service station at 1917-1923 Hennepin avenue. It will be ready for occupancy August 1.

Fall Truck Show for Chicago—Having given up the idea of a commercial vehicle show in the Coliseum, the Chicago Automobile Trade Association's commercial vehicle section held a meeting and decided to promote an outdoor truck show the last week in August.

Poertner Company Moves Stockroom—The Poertner Motor Car Company, New York City, has moved its service department and stockroom to its new quarters at 522 West Fifty-seventh street. The new location is in a fireproof building equipped with modern machinery.

U. S. Tire Opens Branches—The United States Tire Company has opened sub-branches at Jacksonville, Fla., and Richmond, Va. The Jacksonville station will take care of the state of Florida and the Richmond branch has for territory Virginia and parts of West Virginia and North Carolina.

Triple Tread Has Buffalo Branch—The Triple Tread Tire Company, Chicago, Ill., San Francisco, Cal., and Winnipeg, Man., has opened a branch office in connection with the Werick Brothers Motor Car Company, Buffalo, N. Y. W. B. Warnock is local manager of the Triple Tread company's business.

Dixon Company Elects Officers—At the annual meeting of the Joseph Dixon Crucible Company, Jersey City, N. J., officers were elected for the year as follows: President, George T. Smith; vice-president, W. H. Corbin; treasurer, George E. Long; secretary, Harry Dailey; assistant treasurer and assistant secretary, J. H. Schermerhorn.

To Make Automobile Cars—The West Milwaukee shops of the Chicago, Milwaukee & St. Paul and Chicago, Milwaukee & Puget Sound Railway companies have received orders to construct 3,000 box cars, of which 470 will be 50-foot automobile special cars, with large end doors and staggered side doors, and 500 automobile cars for motor car and furniture transportation.

St. Paul Show Was Profitable—The St. Paul Motor Car Dealers' Association, St. Paul, Minn., reports a profit on the second annual automobile show and has reserved the Auditorium for the third week of next February when the third show will be held. After paying the bills, the association voted $1,000 to the Automobile Club of St. Paul, according to the agreement made previous to the show.

To Give Maxwell Mileage Medals—The 50,000-Mile Maxwell Motor Club has been formed by Maxwell owners and agents for the purpose of encouraging long distance touring, and of rewarding Maxwell owners who qualify on a mileage basis. In addition to gold medals for Maxwell owners who have covered 50,000 miles, there will also be silver medals for those who have reached the 25,000-mile mark.

Pittsfield Coal Company Increase—For the purpose of providing more working capital with the object of increasing production, the directors of the Pittsfield Spark Coil Company, Dalton, Mass., have voted to increase the capital stock of the company from $100,000 to $250,000. William P. Wood was elected president and Louis B. Hopkins, treasurer. These, together with Zenas Crane and Michael Casey, constitute the board of directors.

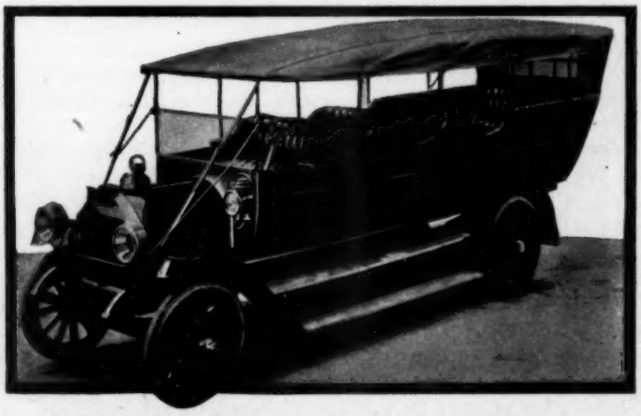
Inheritance Tax on Automobiles—An interesting interpretation of the motor registration law in Wisconsin has just been made by the secretary of state in response to a request from Green Bay. A car which is left to members of a family upon the death of the owner must be re-registered and the fee of $5 paid therefor. New license plates must also be carried. The secretary holds that to bequeath a car practically amounts to a sale.

Wilcox Builds Big Bus for Test—The H. E. Wilcox Motor Car Company, Minneapolis, Minn., has built a test 27-passenger bus for the Warner Company, which is to be utilized on the Iron range of Minnesota between Virginia and Biwabik. If the test is satisfactory, similar busses will be operated by the Girling-Warner Company in suburban service about Minneapolis. The chassis is a standard four-40, with Continental motor and Bosch magneto.

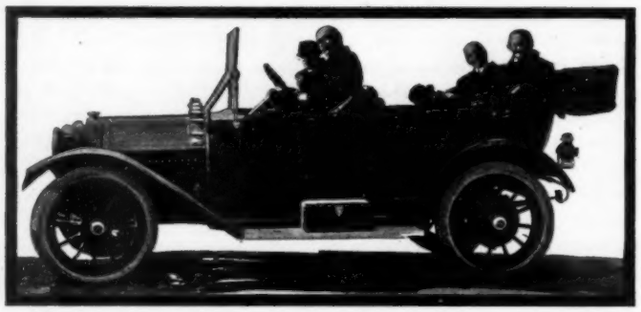
Truck Association Elects Officers—At the annual meeting of the Boston, Mass., Commercial Motor Vehicle Association held recently, the principal business was the election of officers. The following directors were chosen: C. F. Gilmore, Federal and Dayton; A. P. Underhill, Knox; J. S. Hathaway, White; A. T. Fuller, Packard; L. B. Butler, G. M.C.; Day Baker, General Vehicle. Mr. Baker was chosen treasurer and Chester I. Campbell, secretary.

New Design Rubber-Neck Wagon—The G-M-C sightseeing car is the first full fore and side door design on the market. This is a marked advance from the old style, for it is built closely along the pleasure car type of machine, embodying graceful lines, and does not resemble the ordinary rubber-neck design in the least. The body is mounted on a two-ton G-M-C chassis, the wheel-base being 142 inches. The first one finished was shipped to Seattle, where it will be used in conducting parties through the famous Rainier National Park to the line of eternal snow on Mount Tacoma.

Mail Automobile for Syracuse—The Syracuse, N. Y., postoffice has been authorized to purchase an automobile for the collection of mail and an allowance of $60 monthly for the care of the car. The government's conditions are that a collector buy the car and receive the sum from Washington. A trial was held last fall and a collector opened sixty-five mail boxes in 85 minutes. He covered 35 miles in 1½ hours, whereas with horse and wagon 3 hours were needed. A Ford touring car has been bought. Its use will be experimental, further purchase of automobiles depending upon results.



General Motors Truck Company's new sight-seeing 'bus



Governors visiting Panama-Pacific Exposition in Oakland car

Denver Company to Sell Swineharts—The Gessler Williams Tire Company, Denver, Col., has taken the agency for Swinehart tires.

Designing a Sales Building—A two-story automobile sales building is being designed by Strickert & Sloan for Frank Hardart, Philadelphia, Pa.

Herbst Is Elected Secretary—Fred W. Herbst, president of the Columbus, O., Chamber of Commerce, has been elected secretary of the Barndt-Johnson Auto Supply Company.

Boda Company Increases Floor Space—The Robert F. Boda Automobile Company, Columbus, O., has leased an adjoining storeroom, doubling the floor-space of its salesroom.

Pitts Heads Ajax Organization—Henry Pitts, head of the Pitts Supply Company, Lowell, Mass., has been elected president of the Ajax Dealers Association, of New England.

Automobile Delivery in Niagara Falls—Automobile delivery service has been inaugurated by the Jenss Brothers, proprietors of two large department stores in Niagara Falls, N. Y. Overland cars are used.

Gormley Is Truck Department Manager—J. J. Gormley has accepted a position as manager of the truck department of the Myer Abrams & Company's Boston, Mass., agency handling Lauth-Juergens vehicles.

Brown Made Mather Spring Manager—George H. Brown, formerly of the Standard Sales Company, has been made sales manager for the Mather Spring Company, Toledo, O., with headquarters in Detroit, Mich.

Kendall Selling Second-Hand Cars—The Boston Automobile Clearing House Company is the name of a new organization formed by Robert I. Kendall, who is marketing second-hand cars in Cambridge, Mass.

Everitt Sales Succeeds Georgia Motor—The Georgia Motor Car Company, which has handled the Everitt, Brush and National in Atlanta, Ga., has been succeeded by the Everitt Sales Company, which is virtually a factory branch.

Arranging for a Service Station—Manager Jordan, of the New England branch of the R.C.H. Corporation, has leased the building at 148 Berkeley street, Boston, Mass., and is having it fitted up for a service station for the R.C.H. and the Hupp-Yeats electrics.

Yeager Elected Victor President—At a special meeting of the Victor Motor Truck Company, Buffalo, N. Y., Orson E. Yeager, president of the Buffalo Chamber of Commerce, was elected president of the truck concern. The company makes a specialty of motor fire apparatus.

Syracuse to Label City's Cars—The Syracuse, N. Y., commissioner of public safety, H. E. Hessler, has introduced an ordinance in the Common Council requiring that all automobiles owned by the city be plainly marked with the name Syracuse and the department or bureau to which they belong.

Park Opened to Motorists—Keney Park, one of the beauty spots in Hartford, Conn., in which motor cars have never been allowed, will be no longer closed to automobilists, as the trustees have voted to throw the park open to these vehicles under restrictions as to speed, etc. The board of governors of the Automobile Club, of Hartford, sent a vote of thanks to the trustees.

Freight Cars Are Still Scarce—The Syracuse Motor Car Company, Syracuse, N. Y., reports the problem of transporting automobiles from Detroit so serious that it has ordered Ford cars shipped by boat to Buffalo and then driven overland to this city under their own power. The company is advised by the Ford company that no improvement in conditions seems imminent.

Government Buys Trucks—The United States Government has been trying out various types of motor vehicles during the past 3 years to determine, if possible, their value during time of War. The heavier type of truck will be valuable in the handling of ammunition and other bulky supplies usually requiring many horses, and the Velie 3-ton truck has been selected as a type suitable for this work.

Trask to Go to Europe—Charles A. Trask, of the Cartercar Company, Pontiac, Mich., will take a trip to Europe to study automobile engineering practice. Mr. Trask will be gone about 3 months. He will divide his time equally between England and the Continent. In addition to his work for the Cartercar Company Mr. Trask will make investigations for several other automobile concerns.

Federal Establishes Northwestern Branch—The Federal Rubber Manufacturing Company has opened a northwestern branch in Minneapolis, Minn., in charge of W. F. Bigelow.

Matheson Will Establish Branch—Preliminary to the establishment of a branch, the Matheson Automobile Company, Wilkes-Barre, Pa., has opened temporary headquarters at 203 North Broad street, Philadelphia. B. M. Westerman has been placed in charge.

Governors Use Car on Exposition Grounds—During a recent visit of the governors of Washington, Montana and Idaho to the city of San Francisco, Cal., and the site of the Panama-Pacific Exposition, the governors of Montana and Idaho were guests of Governor Hay, of Washington, in the Oakland 45. These big men of Western affairs spent considerable time going over the ground and found the car of great assistance in making every minute count.

Automobile Incorporations

AUTOMOBILES AND PARTS

BARBERTON, O.—Todd & Courtney Company; capital, $10,000; to deal in automobiles and accessories. Incorporators: John H. Todd, Cora A. Todd, I. O. Courtney, Laura M. Courtney, C. C. Courtney.

BOSTON, MASS.—Charles E. Hale & Sons, Inc.; capital, $500,000; to deal in automobiles. Incorporators: R. J. Cram, A. N. Hunt.

BROOKLYN, N. Y.—Sceptre Motor Company; capital, $5,000; to manufacture motors. Incorporators: William Young Chandler, George A. Wingate.

BROOKLYN, N. Y.—T. F. P. Company; capital, $1,000; to engage in the automobile business. Incorporators: E. Mulder, John R. Mulder, F. W. Olmstead.

DALLAS, TEXAS.—Fisk Company of Texas; capital, $25,000; to deal in automobiles. Incorporators: Dan Sonnethiel, E. H. Peck, H. G. Fisk.

INDIANAPOLIS, IND.—Roby Carbureter Company; capital, $10,000; to manufacture parts for automobiles. Incorporators: F. S. Roby, C. J. Schuh, E. D. Salisbury.

INDIANAPOLIS, IND.—Vixen Motor Company; capital, $12,000; to manufacture automobile motors and other parts. Incorporators: C. F. Schmidt, W. J. Harris, C. O. Van Horn, S. B. Lindley and others.

LYNCHBURG, VA.—W. J. Merchant Automobile Agency; capital, $5,000; to engage in the automobile business. Incorporators: W. J. Merchant, C. A. Harrison, J. H. Bugg.

NEW YORK CITY.—Dual Wheel Company; capital, $300,000; to manufacture truck wheels and other parts. Incorporators: F. B. Cochran, A. Dow, C. W. Jewell.

NEW YORK CITY.—El Arco Radiator Company; capital, $10,000; to manufacture radiators. Incorporators: C. Philip Coleman, R. C. Gildersleeve, Vernon Munroe.

NEW YORK CITY.—Isotta Fraschini Motors Company; capital, $25,000; to manufacture and deal in motors. Incorporators: G. Maurice Heckscher, G. Nettleton Thurber, C. B. Jacque.

NEW YORK CITY.—Federal Trucking Company; capital, $20,000; to manufacture motors and deal in them. Incorporators: Donald B. Abbott, Joseph T. Fackenthal, James L. Kauffman.

QUAKER CITY, O.—W. H. Hartley Sons Company; capital, $25,000; to manufacture agricultural implements and vehicles. Incorporators: M. L. Hartley, H. S. Hartley, O. G. Hartley, G. C. Hartley, L. H. Lingo, H. H. Bundy.

J. M. Shock-Absorber Branch Opened—The J. M. Shock-Absorber Company has opened a branch in Philadelphia.

Memphis Club Official Resigns—George W. Buchanan, for two years secretary of the Memphis, Tenn., Automobile Club, has resigned.

Lytle Manager of Apperson—Herbert Lytle is now manager of the Indianapolis branch of Apperson Brothers Automobile Company, of Kokomo, Ind.

Edwards Takes Charge of Moon Branch—The new factory branch of the Moon Motor Car Company in Philadelphia has been placed in charge of E. A. Edwards.

Arranging to Establish Plant—The Jackson Car Company, Ontario, Ltd., Toronto, Can., with $40,000 capital, is arranging for the establishing and equipment of a plant for the manufacture of automobiles and trucks.

El Campo Auto Club Formed—At a meeting of automobile enthusiasts held recently in El Campo, Tex., the El Campo Automobile Club was organized with a charter membership of 53.

Tire Branch in Montreal—The Independent Tire Company of Toronto, Ltd., with factory headquarters at Guelph, Ont., has opened a new Montreal branch and service station, at 321 University street.

Motor Trucks in Pittsburg—Director Howard B. Oursler, of the department of supplies, Pittsburg, Pa., has placed an order for three automobile patrol wagons and three large motor trucks for the handling of hot asphalt.

Motor Sprinklers in Brazil—Three motor sprinkling wagons have been placed in service on the boulevards of Rio de Janiero, Brazil, by the municipal authorities. The tanks have a capacity of 550 gallons. The motors are 42 horsepower.

Profit from Auto Show—According to a statement read recently at a meeting of the St. Paul, Minn., Motor Car Dealers' Association at the Commercial Club, the automobile show conducted by the association in February was a financial success.

Racine Has Mitchell Chemical Car—The Mitchell-Lewis Motor Company has delivered to the city of Racine, Wis., a Mitchell combination chemical and hose car which is now in service in the central fire station. The car is of 30 horsepower and is capable of 50 miles per hour. The chemical equipment was taken from a horse-drawn truck.

Santa Monica Prizes—The events for cars of 301-450 cubic inches and of 451-600 cubic inches displacement in the Santa Monica tournament, May 4, having failed to fill, and the two events abandoned, the Bosch Magneto Company has withdrawn its offer of money prizes for those particular races. The money originally offered for the 301-450 class will be transferred to the 231-300 class.

Georgia Registration 14,000—The registration of automobiles in Georgia has passed the 14,000 mark for the year 1912.

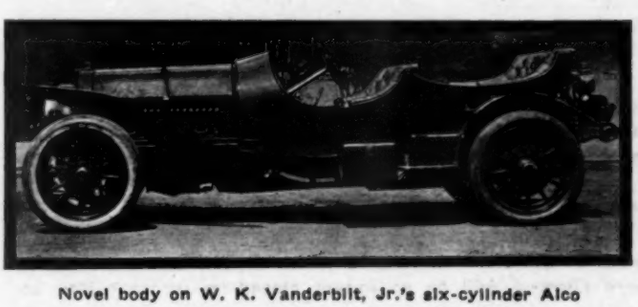
Wilson Henderson Sales Manager—F. E. Wilson has become sales manager for the new Henderson car to be manufactured by the Henderson Motor Car Company, Indianapolis, Ind. C. K. Share has become treasurer of the new company. The first complete model of the Henderson car will make its appearance just before the 500-mile race.

Automobile Agent on Gipsy Trail—A traveling exhibit of motor cars and trucks has been tried out with considerable success in Southern California by J. S. Conwell, manager of the United Motor Los Angeles Company. Mr. Conwell took twelve Maxwell and Columbia cars and a few Sampson trucks on a 2 weeks' tour. His procession surprised many of the smaller towns and cities, but it had the effect of selling cars and giving them widespread advertising.

Mexican Troubles Stop 'Bus Line—Due to the falling off of travel it has been necessary to discontinue the automobile line connecting Jalisco, on the Pan-American Railway, and Tuztla Gutierrez, the capital of Chiapas in Mexico. This line has been operated successfully for 2 years, the two machines used successfully negotiating the heavy mountain grades and changing a 3-days' horseback ride into a pleasant trip of 12 hours. With the passing of the present unsettled condition of affairs the service will be resumed.

Vanderbilt's New Alco—The Alco car just received by William K. Vanderbilt, Jr., is unique for the novel body lines which were designed after ideas of the owner. The car is of the tourabout type and has the appearance of a racer. Among the conspicuous features are the rake in the steering column and a considerable tilt of the fenders, which narrow down at the front. The seats are built close to the tonneau floor. In place of running boards along the sides there is a step close to each rear door. The doors open from back to front. The body lines dip instead of possessing the straight line effect.

Automobile Club Plans Co-operation—In order to promote the interests of both organizations, the Wilmington Yacht Club, which owns a clubhouse on the Delaware River, near Wilmington, Del., has so changed its constitution and by-laws as to make it possible to have a working agreement with the Delaware Automobile Association, the object being to secure the co-operation of members of the latter in events that interest both. The yacht club has changed its name to the Wilmington Yacht and Automobile Association and has made the dues nominal. This is not a merger, however, and the automobile association does not go out of existence, though many of its members have joined the yacht association since the change was brought about.



Novel body on W. K. Vanderbilt, Jr.'s six-cylinder Alco

Automobile Incorporations

WILMINGTON, DEL.—L. F. Shephard & Company; capital, $200,000; to deal in and rent automobiles.

GARAGES AND ACCESSORIES

ALEXANDRIA, VA.—American Pneumatic Starter Company, Inc.; capital, $150,000; to manufacture automobile starters. Incorporators: C. A. Douglas, G. L. Parker, A. E. Leckie.

BROOKLYN, N. Y.—Gayety Taxicab Company; capital, $500; to engage in the taxicab business. Incorporators: Hyman Peskin, Marcus Goldstein, Hyman Gordon.

BURLINGTON, IND.—Burlington Auto Traction Company; capital, $5,000; to operate an automobile garage and livery business. Incorporators: L. O. Dunn, Zora M. Dunn, Laura V. Dunn.

CHICAGO, ILL.—Midwest Automobile Supply Company; capital, $50,000; to manufacture automobile supplies and accessories. Incorporators: S. G. Camp, C. Joseph, B. H. Rifenbark.

DETROIT, MICH.—Coleman Manufacturing Company; capital, $25,000; to manufacture automobile steering wheels.

INDIANAPOLIS, IND.—Indiana Tire Filler Company; capital, $25,000; to make a filler material for inner tubes. Incorporators: R. C. Ellis, F. F. Wiley, F. T. Mitchell.

JERSEY CITY, N. J.—Unique Vulcanizing Company; capital, $50,000; to do a general automobile business. Incorporators: J. H. Hutten, J. P. Becker, U. C. Huber, E. R. Hussey.

NEW YORK CITY.—Tire Cord Company; capital, $100,000; to manufacture tires, rims, etc. Incorporators: R. V. Stewart, P. J. O'Connell, H. P. Reader.

SOUTH BUFFALO, N. Y.—Garage Company; capital, $10,000; to do a garage business. Incorporators: Wm. F. Coatsworth, Mary L. Coatsworth, Leon R. Jenkins.

CHANGES OF CAPITAL

CLEVELAND, O.—Grant Motor Car Company; capital increased from $10,000 to $15,000.

DALTON, MASS.—Pittsfield Spark Coil Company; capital, increased from $100,000 to $250,000.

GALION, O.—Howard Motor Car Company; capital decreased from $300,000 to $6,000.

Fleet of twenty Garford livery cabs in the service of Frank Parmelee, Chicago

News of the Garages

Chase Opens Salesroom—The Chase Motor Truck Sales Company, Minneapolis, Minn., has opened a salesroom and garage for the sale and care of Chase trucks.

New Garage for Tyrone—Frank Hewell is preparing to open a garage in Tyrone, Pa., where he will also handle the Michigan car.

Manasquan's Gets Garage—E. A. Watts, Manasquan, N. J., is building a garage 50 by 80 feet at the corner of Main street and Pierce avenue.

Noble Buys in St. Marys—Stafford Noble, St. Marys, Ohio, has purchased the garage formerly controlled by August Schierenback.

Building Garage in Saybrook—Superintendent J. E. Sewell, of the Shore Line trolley, is having constructed a garage 40 by 90 feet on the lot adjoining the railroad on Ferry street, at Old Saybrook, Conn.

Durrant Buys Prospect Garage—The Prospect Garage, Niagara Falls, N. Y., one of the best in that city, has been purchased by W. O. Durrant, who is going to have it remodeled.

Butler County Garage—A. C. Hileman is manager of a new garage opened in Butler, Pa., and known as the Butler County Auto Company. The location is in the Duffy building, 228 West Jefferson street.

Turns Foundry into Garage—D. G. Pfoutz, manager of the Chambersburg Auto Company, Chambersburg, Pa., has purchased from the T. B. Wood's Sons Company a large foundry building, which he is converting into a garage.

Stoffel and Bosustow Separate—The partnership of Stoffel and Bosustow, Racine, Wis., garage and agency business, has been dissolved, Jacob Stoffel withdrawing. The business will be continued by his former partner.

Hub Garage Burned—The Hub Automobile Company, Boston, Mass., located at 93-97 Freeport street, was burned recently, resulting in a loss of $20,000. The cause of the fire is being investigated.

New Boston Garage—The United Garage Company, Boston, has been organized with the following officers: President, Jesse Goode; treasurer, James R. Jones, and secretary, W. F. Waters.

Philadelphia's $100,000 Garage—George C. Boldt has plans completed for a garage at 1401-1411 Locust street, Philadelphia, which will cost $100,000. It will measure 150 by 102 feet and will be four stories high.

Kimber Manages Westport Garage—The Country Club Garage and the Westport Machine Company have opened a large public garage on Riverside avenue, Westport, Conn., under the management of John A. Kimber.

Large Rochester Garage—The new garage and showroom of the J. J. Mandery Motor Car Company has been opened. The building covers 32,000 square feet and has a showroom 70 feet square with a 28-foot ceiling. The repair department has capacity for twenty-five cars.

Kissel Designer in Garage—George Schmidt, a designer in the truck department of the Kissel Company, has organized the Grand Rapids Automobile Repair & Supply Company, Grand Rapids, Wis., and has established a garage and repair shop in the buildings of the Kreiger Machine Company.

Lammerts' Niagara Garage—Contracts will be awarded this week by Peter Lammerts, Niagara Falls, N. Y., for a garage to accommodate twenty-five cars. The building will be 100 by 48 feet, of fireproof construction and will cost $8,000.

New Automobile Agencies

PLEASURE CARS

Place	Car	Agent
Atlantic City, N. J.	Stutz	Clement L. Smith.
Birmingham, Ala.	Alco	Highland Garage Co.
Boston, Mass.	Detroiter	Andrews-Dykeman Co.
Cumberland, Md.	Velie	George L. Carver.
Danville, Ill.	Alco	N. E. Holden.
Dubuque, Iowa	Alco	Dubuque-Rambler Auto and Supply Co.
Evansville, Ind.	Alco	Advance Auto & Machine Co.
Frederick, Md.	Krit	T. Irving Miller Co.
Hagerstown, Md.	Krit	W. W. Baar.
Huntington, W. Va.	Lion	Lion Motor Sales Co. of W. Va.
Lake Forest, Ill.	Franklin	Gust. Johnson.
Louisville, Ky.	Lozier	Louisville Lozier Co.
Manila, P. I.	Alco	E. C. McCullough.
Marshfield, Wis.	Ford	Marshfield Auto & Hardware Co.
Mason City, Iowa	Velie	Morton Auto Co.
Memphis, Tenn.	King	Blomberg Automobile Co.
Montgomery, Ala.	Franklin	W. N. Cannon.
Omaha, Neb.	Lion	Held-Woodman Auto Co.
Portsmouth, Ohio	Alco	Walter K. Patterson.
Salt Lake City, Utah	Franklin	Salt Lake Automobile Co.
Scranton, Pa.	Alco	Lawrence M. Connell.
St. Louis, Mo.	Lion	Payne Auto Co.
Toledo, Ohio	Apperson	M. E. Humbarger & Samuel Hoever.
Victoria, B. C.	Packard	H. Berg.

ELECTRIC CARS

Albany, N. Y.	Adams	Central Automobile Co.
Duluth, Minn.	Adams	Electric Service & Repair Co.
Newark, N. J.	Adams	Hoagland-Thayer, Inc.
York, Pa.	Baker	Harry R. Pfeiffer.

COMMERCIAL VEHICLES

Boston, Mass.	Mercury	Bratt Engine & Bolt Co.
Boston, Mass.	Universal	Charles Addison Malley.
Gloucester, Mass.	Mercury	Percy W. Wheeler.
Greenfield, Mass.	Mercury	W. M. Cutler.
Haverhill, Mass.	Mercury	Ford & Luce.
Medford, Mass.	Federal	Frank Riley Co.
Providence, R. I.	Mercury	Teel Mfg. Co.

Factory Miscellany

BIG DETROIT PLANT FOR CONTINENTAL—The new Detroit plant of the Continental Motor Manufacturing Company, Muskegon, Mich., under construction for some time, is now nearing a state of completion and will soon be in operation. It will more than double the capacity of the Muskegon factory, which, with an annual output of 18,000 to 20,000 gasoline motors, is too small to satisfy the demand. It is situated on Jefferson avenue adjoining the Hudson Motor Car Company plant on the east and is in the section of Detroit called Fairview. The building is fireproof, of structural steel and reinforced concrete, with steel window sashes, and all other details of the most improved types. A sprinkling system gives additional fire protection. Everything possible will be done toward providing comfort for the employees. The main building is two stories high and over 500 feet in length.

Spark-plug Makers Enlarge Plant—The Jeffrey-Dewitt Company, Detroit, manufacturer of spark-plugs, will add to its facilities by erecting a two-story addition 40 by 100 feet to be devoted exclusively to the making of porcelains for spark-plugs.

Lafayette Gets New Factory—The Ross Gear & Tool Company has selected a site on North Eighth street, Lafayette, Ind., for the erection of its new factory, which, when completed, will contain 50,000 square feet of floor space. The company manufactures steering gears for trucks.

East Aurora to Have Factory—Papers have been filed in the county court in East Aurora, N. Y., for the incorporation of an automobile factory to be known as the East Aurora Motor Car Company; capitalization, $8,000. The incorporators are Arthur L. Pierce, Manley B. Paxon and Winfield S. Wilson.

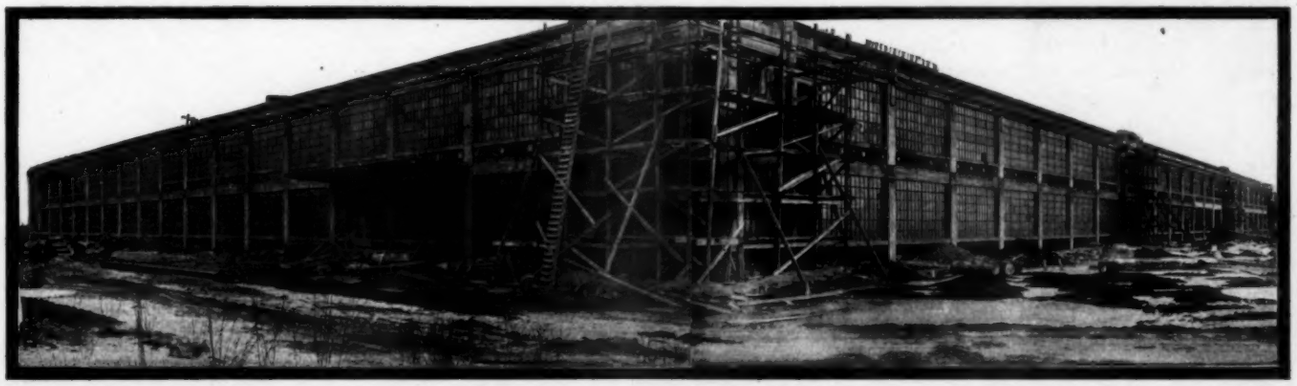
Organizing Canadian Ohio Company—Negotiations which have been in progress for some time with the Board of Trade of Colborne, Ont., looking to the establishment by the Ohio Motor Company, Cincinnati, Ohio, of a Canadian plant have finally been consummated and the Canadian company is in process of organization. It will be incorporated.

Croxton to Move to Washington, Pa.—J. P. Stoltz, president of the Croxton Motor Company and the Washington, Pa., Board of Trade, has entered into a contract whereby the Croxton company will remove its factory from Cleveland, Ohio, to that city. Contracts for a new plant 600 by 120 feet will be let and the factory will be located on the Baltimore & Ohio Railroad. The company will build taxicabs and will employ 200 men.

Making F-S Delivery Wagons—The Filer & Stowell Company, Milwaukee, Wis., which owns the Beaver Motor Company, Petrel Motor Car Company and other interests, is now devoting its big auxiliary plant at First and Oklahoma avenues, at the southern city limits of Milwaukee, to the production of the F-S light delivery car. The Beaver motor is used, as are Weston-Mott rear axles. The production is going on under the name of the F-S Motors Company.

To Double Present Capacity—The Wisconsin Motor Manufacturing Company will this year build an addition which will practically double its capacity. The plant has been working night and day for several months and its orders ahead for 1913 and 1914 delivery are so heavy that more floor space is imperative. The present plant was finished only about 18 months ago. Recently 150 mechanics went on a strike because of a change in the premium system, but are now back at work. The strike caused no inconvenience as it affected departments which the short interruption did not retard.

Contract Awarded for Federal Plant—The Federal Rubber Manufacturing Company, Milwaukee, Wis., has awarded the contract for the erection of a new factory building at Cudahy, Milwaukee county, to the Westinghouse-Church-Kerr Company, New York City. The building will be six stories high, 100 by 400 feet, and practically double the capacity of the present Federal plant. Six other additions are now being completed, making the total floor space 170,000 square feet. The Federal company was organized about a year ago by Byron C. Dowse, Richard Ward and Herbert A. Githens, all formerly associated with the G. & J. Tire Company, of Indianapolis. It purchased the plant of the Federal Rubber Company, a $1,000,000 corporation, which thereupon dissolved. At the beginning of the Federal Rubber Manufacturing Company's activities its plant employed thirty-eight workmen. Today more than 600 are engaged in production and selling. The output will be $5,000,000 worth of tires and rubber goods per year when present additions are completed. The company's total investment at Cudahy is $1,300,000.



The Detroit plant of the Continental Motor Company, of Muskegon, Mich., which is nearing completion

Yankee Automobile Self-Starter; Kingston Safety Lock Switch; Daisy Acetylene Lamp Igniter; Buckeye Spring Repairer; V-Ray Spark Plug

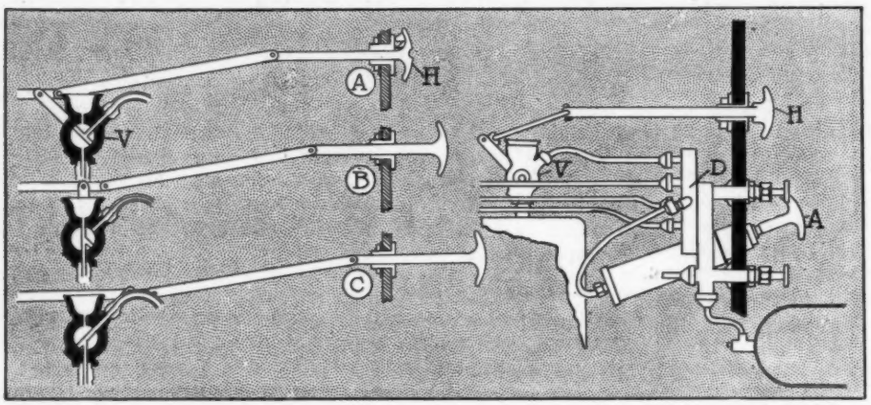


Fig. 1—Yankee self-starter mechanism for controlling flow of acetylene into motor cylinders

A NOVEL acetylene starting system is made by the Yankee Company, Utica, N. Y. This device comprises four priming valves V of special construction, a distributer valve D for connecting the cylinders to the acetylene tank, an air pump A and a lever system for putting the priming valves in the proper positions. Fig. 1 illustrates the construction of the priming cup and the position of the valve during the several stages of its operation. Stage A shows its position while the car is in operation or at rest, the valve closing tightly against its seat so that the cylinder compression is not impaired. Stage B illustrates the position of the valve if the handle H is pulled out half way. In this way communication is made between the combustion chamber and the atmosphere, and atmospheric pressure is established in all the cylinders. Then the handle is pulled to its limit, resulting in stage C. In this position the distributer valve is in communication with the interior of the cylinders, and by turning the starting handle on the distributer a charge of acteylene is admitted to the cylinders. Then six full charges of the air pump are forced into the cylinders, being thereby mixed with the gas, after which the handle H is pushed back into Stage A. The cylinders being filled with a combustible mixture, it is only necessary to throw on the battery, and the engine will start.

Kingston Safety Lock Switch

Advancement in switches is illustrated in the Kingston switch, made by the Kokomo Electric Company, Kokomo, Ind. The mechanism of this switch is contained in a hard-rubber casing, Fig. 3, and is composed of two pairs of diametrically opposed contact points, one for each magneto and battery. The construction of the switch proper is clearly shown in Figs. 2 and 4. The former illustration shows the appearance of the switch body with the front of the casing removed. Connection is made by turning the piece C into a position where it connects the two contact points of either the battery or the magneto system. The springs S, Fig. 4, which are attached to the lower side of the piece C, press hard against the casing, and when the handle H of the switch is turned the piece C remains undisturbed. If the key K is inserted in the lock and pressed down as far as it will go, the end of the part H_1 is keyed to the piece C, so that if either key or handle is turned the piece C is also turned and connects co-ordinate contact points. The button B, Fig. 3, is provided to tickle the battery in starting the motor. The manufacturer of the Kingston switch also makes a type without the tickler button; in this design the upper battery contact point is not extended as in the button type, but is of the same length as the three other contact points. Wire connections to battery and magnet are made by means of four terminal screws attached to the back of the device which is screwed onto the dashboard.

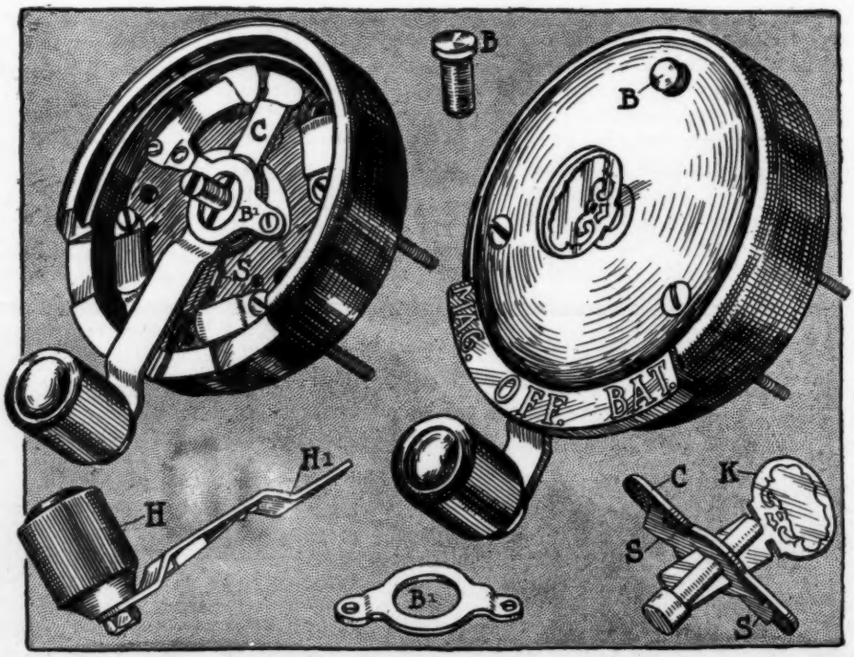


Fig. 2—Mechanism of the Kingston 1912 switch. Fig. 3—Exterior of Kingston switch. Fig. 4—Component parts of switch body proper.

Daisy Acetylene Lamp Igniter

The Simkin Manufacturing Company, 1507 Michigan avenue, Chicago, Ill., is now marketing the Daisy electric system for lighting acetylene lamps. The principal feature of this system is

that it utilizes the magneto current for igniting the acetylene. The Daisy controller, which is constructed to regulate the flow of gas to the lamps and contains a switch for producing a spark at the headlight igniter, is shown in Fig. 6. This device is composed of two sections, the gas transfer ports and valves, and the electrical portion, consisting of the magneto wire to the controller and one thence to a plug and a switch which, if pressed, breaks the circuit from the magneto terminal to the spark-plug and connects the magneto conduits to the headlight igniter, which is then thrown into operation.

The gas-regulating mechanism consists of a needle valve N which opens or closes the pipe from the tank to the burners. The desired pressure is given to the gas by passing it through a passage regulated by a needle P, the gas entering at I, flowing past needles N and P and out through O to the lights. The switch S, Fig. 6, is illustrated in detail in Fig. 5. The wire L leads to the igniter, M to the magneto terminal and P to the spark-plug. The channel-shaped switch body is carried on the spring-controlled shaft S, connecting M and P; if, however, the shaft D is pushed in it short-circuits the current, which then passes from M to L on the controller, thence to L on the burner and through the two igniters, where it produces two sparks, being finally grounded to the magneto from the burner terminal G. The system is remarkable for its simplicity, and has the further advantage that it will work as long as the ignition system is in operation.

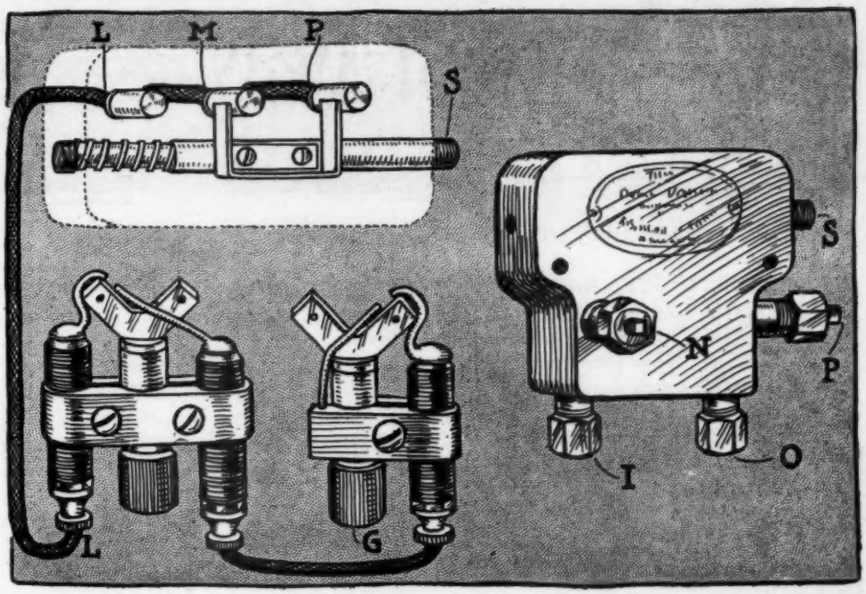


Fig. 5—Daisy system of short-circuiting magneto current to ignite acetylene. Fig. 6—View of Daisy igniter dashboard controller

The Buckeye Spring Repairer

To hold in position the broken members of a spring, the Buckeye spring repairer is supplied by the Central Brass & Fixture Company, Springfield, O. This repair device consists simply of a straight and a dropped plate which are placed above and below the damaged spring portion and are held there by means of two angle brackets kept tight on the plates by means of nuts engaging their threaded ends. The illustration, Fig. 7, shows how a spring fracture at the end and one at the center of the spring are mended; but, of course, an injury occurring at any other portion of the spring may also be repaired by means of the Buckeye device.

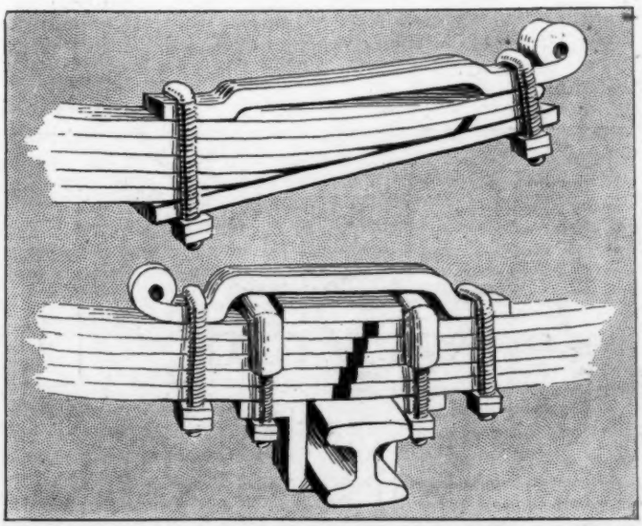


Fig. 7—Method of applying the Buckeye spring repairer to fractures on end and center of elliptic springs

The Eureka Anti-Skid Tire Chain

The Eureka Non-Skid Manufacturing Company, 591 Bergen streets, Brooklyn, N. Y., is making a novel type of anti-skid apparatus. The device consists of a number of rhomboidal metal bands slightly curved to fit the periphery of the tread and having outwardly turned flanges for securing better traction on the road than can be obtained by the tire tread alone. The metal anti-skid shoes are held together by means of a chain which is laid around the tire. Being built sufficiently heavy, the Eureka product is also made for use on dual tires, suitable for truck work.

V-Ray Spark-Plug

The V-ray spark-plug, Fig. 8, made by the M. M. M. M. Company, Inc., Marshalltown, Ia., is designed for very hard service. It has two principal pieces: the shell carrying the negative electrodes, and the brass gland holding the porcelain, positive electrode and terminal post. There are four negative spark-points, and in case of their sooting it is merely necessary, according to the maker, to turn the knurled screw attached to the terminal post, thus cleaning them at once. The V-Ray plug is made in fifteen sizes, including the regular 1-2-inch standards, metrics and the 7-8-inch A. L. A. M. thread. All the electrodes are made of a special alloy; the porcelain is of very high electrical resistance.

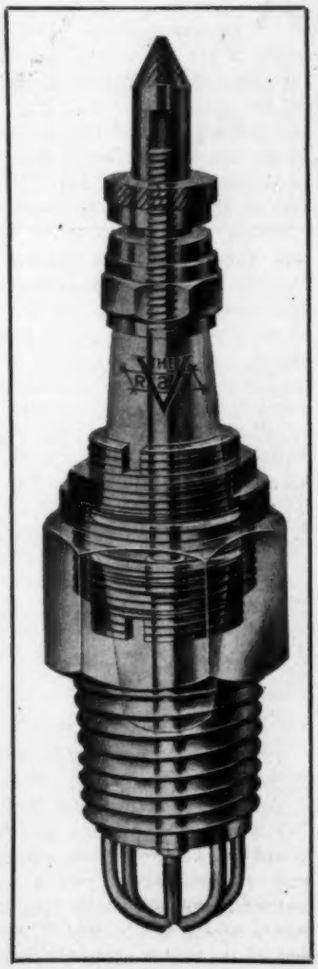


Fig. 8—Phantom view of the V-Ray guaranteed spark-plug

Patents Gone to Issue

MAGNETO GENERATOR—In which the magnets are surrounded by a field coil.

This patent relates to a magneto, Fig. 1, which consists of a permanent horseshoe magnet, a soft iron magnet arranged parallel with the former and an armature between both ends of both magnet sets. A pair of oppositely located pole-pieces is provided, each pole-piece being in contact with the adjacent ends of both magnets. There is an armature between the pole-pieces and a field coil surrounds the magnetic circuits of both field magnets.

No. 1,024,225—To B. P. Remy, F. J. Remy, F. P. McDermott, I. J. Reuter, assignors to the Remy Electric Company, Anderson, Ind. Granted April 23, 1912; filed January 16, 1911.

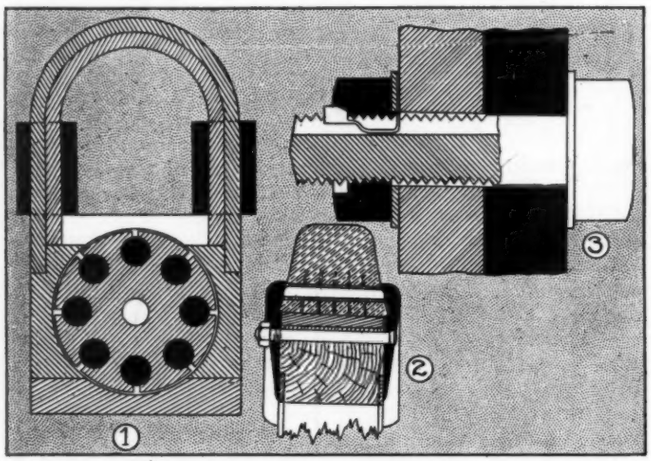


Fig. 1—Remy magneto generator. Fig. 2—Marchant electric tire. Fig. 3—Muller nut-locking device

Nut-Locking Device—In which teeth are engaged to keep the nut in position on the bolt.

The subject-matter of this patent is a nut-locking device, Fig. 3, comprising, in combination with a bolt having a longitudinally extending groove, a washer which is mounted on the bolt and has its inner face shaped with a longitudinally extending groove. In the groove of the bolt is seated a resilient locking member which has a longitudinal body portion and from the inner end of which projects a right-angular extension which is seated in the groove of the washer. The member mentioned has also an outer, upwardly curved projection terminating in a beveled tooth. A nut mounted on the bolt against the washer has its outer face fitted with teeth adapted to be engaged by the tooth aforementioned, so that the latter and the portion of which it is part prevent the nut turning.

No. 1,024,274—To Andrew D. Miller, Johnstown, Pa. Granted April 23, 1912; filed December 4, 1911.

Elastic Tire—Which is held to the rim by rods engaging slots in the latter.

This patent refers to a tire, Fig. 3, mounted on a rim and wheel and through which pass rods surrounded by sleeves. Laterally of the rim are arranged clamping rings wedge-shaped in cross-section and provided with slots into which the rods project; the ends of the rods bear against inclined surfaces which cause them to move toward the wheel rim. Bolts pass through the rim of the wheel and the rings.

No. 1,024,090—A. G. Marchant, G. P. Marchant, London, England. Granted April 23, 1912; filed April 22, 1907.

Vehicle Wheel—In which the place of the spokes is taken by dished plates.

This patent describes a construction of wheel, Fig. 6, with dished plates extending from hub to rim, these plates having channeled edges which grip rubber blocks between them. The channeled edges form the bearing and the support of the rubber tread composed by the blocks and resist any inward thrust of the tread.

No. 1,024,154—To Robert Thomas Smith, Warrington, England. Granted April 23, 1912; filed December 21, 1908.

Internal-Combustion Motor—Two-cycle design, reciprocating sleeve valve engine.

This patent refers to a two-cycle motor, Fig. 5, containing a reciprocable sleeve fitting tightly against the cylinder walls and open at both ends. A piston works inside of the sleeve and there is an inlet and an exhaust port in the sleeve, these ports being spaced the same distance as the corresponding cylinder ports. The sleeve moves always in the same direction with the piston, but its travel is shorter, the ports being so located that they are closed when the sleeve and piston approach the inner dead center but open when the reciprocating parts come near the outer dead center.

No. 1,023,957—To James Courthope, Peache, Rugby, England. Granted April 23, 1912; filed July 5, 1910.

Clutch—Which also serves as engine starter.

This mechanism, Fig. 4, includes a motor shaft, a driven shaft, a clutch member mounted for rotation independently of the driven shaft and a spring connection between that clutch member and the shaft. Means are provided to hold the spring against relative movement while under stress. Clutch members are mounted on the motor and the driven shaft and means are provided for shifting the shafts into engagement with the other shaft and for releasing the spring ends from their fixed relation; there are also means for automatically holding one of the spring ends against movement.

No. 1,024,099—To Edgar U. G. Reagan, assignor to Reagan Clutch Company, San Antonio, Tex. Granted April 23, 1912; filed August 26, 1910.

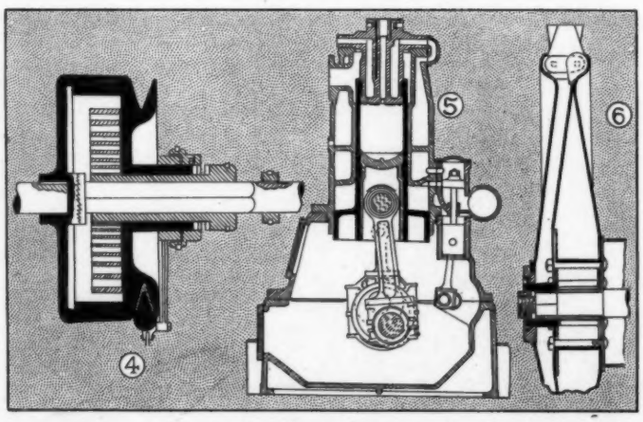


Fig. 4—Reagan clutch. Fig. 5—Courthope motor. Fig. 6—Smith vehicle wheel